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por el

DR. LUIS RAZETTI

Organo de la Academia Nacional de Medicina
y del Congreso Venezolano de Ciencias Médicas

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de Caracas

Órgano oficial de la Academia Nacional de Medicina
y del Congreso Venezolano de Ciencias Médicas

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Guest Editor
Ferry Efendi

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La GMC sigue las Recomendaciones para la realización, informe, edición y publicación de trabajos académicos en revistas médicas, del Comité Internacional de Editores de Revistas Médicas conocidas como Recomendaciones ICMJE [www.ICMJE.org, Gac Méd Caracas. 2020;128(1):77-111]. Las unidades deben presentarse de acuerdo con el Sistema Internacional de Unidades (SI) [Gac Méd Caracas. 2015;123(1):46-71].

En la GMC se dará cabida a los trabajos realizados por profesionales de la medicina o especialidades conexas, presentados en la Academia, en los Congresos de Ciencias Médicas y los que sugiera la Corporación a través del Comité Científico, y aceptación final por la Dirección-Redacción. Los manuscritos enviados a la GMC —escritos en español o en inglés—, serán revisados por el Comité Editorial y— si reunen la calidad científica y cumplen con las normas de presentación necesarias— serán sometidos a un proceso de arbitraje externo por personas con competencias similares a las de los productores del trabajo (pares) para su debida evaluación. Queda entendido que el Comité Editorial puede rechazar un manuscrito, sin necesidad de acudir al proceso de arbitraje, si se incumple con lo mencionado.

La opinión, crítica y recomendaciones de los revisores son recibidas en forma escrita y anónima y se enviarán a los autores, cuando así lo decida la Dirección-Redacción.

Todos los trabajos deberán ser enviados por Internet y en papel escrito en computadora a doble espacio, letra Times New Roman tamaño 12, por el anverso del papel, tamaño carta, con amplio margen libre en todo el contorno.

La GMC considerará contribuciones para las siguientes secciones:

Artículos de revisión
Artículos originales
Artículos especiales
Casos clínicos
Historia y filosofía de la medicina
Información epidemiológica
Bioética
Comunicaciones breves
Perlas de observación
Noticias y cartas al editor
Varios

Los trabajos enviados deberán cumplir con los requisitos que se describen a continuación.

EDITORIALES

Esta sección estará dedicada al análisis y la reflexión sobre los problemas de salud de la población, los distintos enfoques preventivos y terapéuticos, así como los avances logrados en el campo de la investigación biomédica y otros que considere la Dirección-Redacción.

ARTÍCULOS ORIGINALES

Deberán contener en la página frontal, el título conciso e informativo del trabajo; nombre(s) y apellido(s) de cada autor; grados académicos de los autores e institución en la cual se realizó el trabajo; nombre y dirección actual del autor responsable de la correspondencia; un título corto de no más de 40 caracteres (contando espacios y letras) y las palabras clave.

Los trabajos originales, revisiones sistemáticas y metanálisis deben tener un resumen estructurado, como se indica a continuación:

Debe contener un máximo de 250 palabras, y los siguientes segmentos:

- Introducción: ¿Cuál es el problema principal que motivó el estudio?
- Objetivo: ¿Cuál es el propósito del estudio?
- Métodos: ¿Cómo se realizó el estudio? (selección de la muestra, métodos analíticos y observacionales).
- Resultados: ¿Cuáles son los aspectos más importantes? (datos concretos y en lo posible su significancia estadística)
- Conclusión: ¿Cuál es la más importante que responde al objetivo?

Al final se anotarán 3 a 6 palabras clave.

Resumen en inglés

Debe corresponderse con el resumen en español. Se sugiere que este sea revisado por un traductor experimentado, a fin de garantizar la calidad del mismo.

Introducción

Incluir los antecedentes, el planteamiento del problema y el objetivo del estudio en una redacción libre y continua debidamente sustentada por la bibliografía.

Método

Señalar claramente las características de la muestra, el o los métodos empleados con las referencias pertinentes, de forma que se permita a otros investigadores, realizar estudios similares.

Resultados

Incluir los hallazgos importantes del estudio, comparándolos con las figuras estrictamente necesarias y que amplíen la información vertida en el texto.

Discusión

Relacionar los resultados con lo reportado en la literatura y con los objetivos e hipótesis planteados en el trabajo.

Conclusión

Describir lo más relevante que responda al objetivo del estudio.

Agradecimientos

En esta sección se describirán los agradecimientos a personas e instituciones así como los financiamientos.

Referencias

Se presentarán de acuerdo con las Recomendaciones ICMJE.

Indicarlas con números arábigos entre paréntesis en forma correlativa y en el orden en que aparecen por primera vez en el texto, cuadros y pie de las figuras. En las citas de revistas con múltiples autores (más de seis autores), se deberá incluir únicamente los 6 primeros autores del trabajo, seguido de et al.,

a. Artículos en revistas o publicaciones periódicas: apellido(s) del autor(es), inicial del nombre(s). Título del artículo. Abreviatura internacional de la revista: año; volumen: páginas, inicial y final. Ejemplo: Puffer R. Los diez primeros años del Centro Latinoamericano de la Clasificación de Enfermedades. Bol. Of San Pam. 1964;57:218-229.
b. Libros: apellido(s) del autor(es), inicial(es) del nombre(s). Título del libro. Edición. Lugar de publicación (ciudad): casa editora; año. Ejemplo: Plaza Izquierdo F. Doctores venezolanos de la Academia Nacional ade Medicina. Caracas: Fundación Editorial Universitaria, 1996. (No lleva "Edición" por tratarse de la primera).
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Las fotografías de objetos incluirán una regla para calibrar las medidas de referencia.

En las microfotografías deberá aparecer la ampliación microscópica o una barra de micras de referencia.

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Se publicarán únicamente trabajos originales de presentaciones en Congresos de Ciencias Médicas. Serán enviados a la Gaceta por los coordinadores, quienes se responsabilizarán de la calidad, presentación de los manuscritos, secuencia y estructura, incluyendo un resumen general en español y en inglés, en formato libre y que no excedan de 250 palabras. Cada contribución no excederá de 10 cuartillas y deberá apegarse a lo señalado en estas instrucciones a los autores.

Artículos de revisión

Versarán sobre un tema de actualidad y de relevancia médica. El autor principal o el correspondiente deberá ser una autoridad en el área o tema que se revisa y anexará una lista bibliográfica de sus contribuciones que avale su experiencia en el tema.

Las secciones y subtítulos serán de acuerdo con el criterio del autor. Incluir un resumen general en español y en inglés que no exceda de 150 palabras. La extensión máxima del trabajo será de 20 cuartillas. Las ilustraciones deberán ser las estrictamente necesarias, no siendo más de seis, la bibliografía suficiente y adecuada y en la forma antes descrita.

Artículos especiales

Son aquellas contribuciones que por su importancia el Comité Redactor considere su inclusión en esta categoría.

Casos clínicos

Deberán constar de resumen en español e inglés (máximo 100 palabras) en formato libre. Constará de introducción, presentación del caso, discusión, ilustraciones y referencias, con una extensión máxima de 10 cuartillas y apegadas a las instrucciones a los autores.

Historia y filosofía de la medicina

En esta sección se incluirán los artículos relacionados con aspectos históricos, filosóficos, bases conceptuales y éticas de la medicina. Aunque su estructura se dejará a criterio del autor, deberá incluir resúmenes en español e inglés (máximo 100 palabras) en formato libre, referencias bibliográficas citadas en el texto y en listadas al final del manuscrito, siguiendo los lineamientos citados para los manuscritos de GMC.

Actualidades terapéuticas

Se informará sobre los avances y descubrimientos terapéuticos más recientes aparecidos en la literatura nacional e internacional y su aplicación en nuestro ámbito médico. La extensión máxima será de cuatro cuartillas y con un máximo de cinco referencias bibliográficas. Deberá incluir resúmenes en español en inglés, en formato libre (máximo 100 palabras).

Información epidemiológica

Será una sección de información periódica sobre los registros epidemiológicos nacionales e internacionales, destacando su importancia, su comparación con estudios previos y sus tendencias proyectivas. La extensión máxima será de cuatro cuartillas y deberá incluir resúmenes en español en inglés (máximo 100 palabras), en formato libre.

Comunicaciones breves

Serán considerados en esta sección, los informes preliminares de estudios médicos y tendrán la estructura formal de un resumen como se describió previamente (máximo 150 palabras). Se deberán incluir 10 citas bibliográficas como máximo.

Bioética

Se plantearán los aspectos éticos del ejercicio profesional y aquellos relacionados con los avances de la investigación biomédica y sus aplicaciones preventivas y terapéuticas. Su extensión máxima será de cuatro cuartillas y cuatro referencias bibliográficas, deberá incluir resúmenes en español e ingles (máximo 100 palabras) en formato libre.

El médico y la ley

Esta sección estará dedicada a contribuciones tendientes a informar al médico acerca de las disposiciones legales, riesgos y omisiones de la práctica profesional que puedan conducir a enfrentar problemas legales. Su máxima extensión será de cuatro cuartillas y no más de cinco referencias bibliográficas. Deberá incluir resúmenes en español e inglés (máximo 100 palabras).

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2. Título breve y relevante en una página.
3. Resumen corto que integre las conclusiones del informe para un público con orientación clínica.
6. Nombre(s) del autor(es), títulos académicos, instituciones(s) y ubicación.
7. Un máximo de nueve referencias.
8. Se limitará a un total de 2 figuras y/o cuadros.

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The Intersection of the COVID-19 Pandemic and Population Health

Ferry Efendi

Invited Editor

The world has witnessed the great impact of the novel coronavirus disease 2019 (COVID-19) on all aspects of population health. The ongoing coronavirus pandemic remains uncertain when it comes to ending or shifting into endemic status. Communicable disease hit back the world while the non-communicable disease remains a big challenge. Some countries have opened their borders and exercised relaxation in several sectors, including the mobility of people. The current pandemic provides an opportunity to reflect on the status of the healthy population and how research interplays within society.

Some countries have made Universal Health Coverage (UHC) and created significant progress in good health for all through Sustainable Development Goals (SDGs). Indonesia as one of the middle-income countries has committed to support and sustain the global agenda including UHC and SDGs. The double burden of disease for both communicable and non-communicable diseases remain a huge challenge that requires a big investment in research and development. Stroke, ischemic heart disease, diabetes, cirrhosis, and tuberculosis were among the top five killers in Indonesia. Numerous health development initiatives have been undertaken to target all populations. In addition, stressing greater access to services, quality, comprehensive, and integrated health services for women, children, and adolescents also requires equal priority.

The current special issue examines the various areas of health issues which focuses on medicine and the health sciences to address health problems. This supplement has 46 manuscripts that present multidisciplinary healthcare settings, including stunting, diabetes mellitus, COVID-19, stroke, hyperemesis gravidarum, hypertension, nursing management, smoking behaviour, tuberculosis, education, kidney disease, mental disorder, HIV/AIDS, and complementary therapy. All manuscripts in these supplements are written in English. We hope that the research results presented in these articles will strengthen the development of health research and contribute to improving the health of a population.

La intersección de la pandemia de COVID-19 y la salud de la población

Ferry Efendi

Editor Invitado

El mundo ha sido testigo del gran impacto de la enfermedad del nuevo coronavirus 2019 (COVID-19) en todos los aspectos de la salud de la población. La pandemia de coronavirus en curso sigue siendo incierta cuando se trata de terminar o cambiar a un estado endémico. Las enfermedades transmisibles devolvieron el golpe al mundo, mientras que las enfermedades no transmisibles siguen siendo un gran desafío. Algunos países han abierto sus fronteras y ejercen la relajación en varios sectores, incluido el de la movilidad de las personas. La pandemia actual brinda la oportunidad de reflexionar sobre el estado de salud de la población y cómo la investigación interactúa dentro de la sociedad.

Algunos países han logrado la Cobertura Universal de Salud (UHC) y crean un progreso significativo de buena salud para todos a través de los Objetivos de Desarrollo Sostenible (ODS). Indonesia, como uno de los países de ingresos medios, se ha comprometido a apoyar y sostener la agenda global, incluidos la UHC y los ODS. La doble carga de morbilidad, tanto para las enfermedades transmisibles como para las no transmisibles, sigue siendo un gran desafío que requiere una gran inversión en investigación y desarrollo. Los accidentes cerebrovasculares, la cardiopatía isquémica, la diabetes, la cirrosis y la tuberculosis se encuentran entre las cinco principales causas de muerte en Indonesia. Se han emprendido numerosas iniciativas de desarrollo de la salud dirigidas a toda la población. Además, enfatizar un mayor acceso a los servicios, servicios de salud de calidad, integrales e integrados para mujeres, niños y adolescentes también requieren igual prioridad.

El número especial actual examina las diversas áreas de los problemas de salud y se centra en la medicina y las ciencias de la salud para abordar los problemas de salud. Este suplemento tiene 46 manuscritos que presentan entornos multidisciplinarios de atención de la salud, incluidos retraso en el crecimiento, diabetes mellitus, COVID-19, accidente cerebrovascular, hiperémesis gravídica, hipertensión, manejo de enfermería, tabaquismo, tuberculosis, educación, enfermedad renal, trastorno mental, VIH/SIDA y terapia complementaria. Todos los manuscritos de este suplemento están escritos en inglés. Esperamos que los resultados de investigación presentados en estos artículos fortalezcan el desarrollo de la investigación en salud y contribuyan a mejorar la salud de una población.

ARTÍCULO ORIGINAL

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Mental health management in online learning media during the COVID-19 pandemic for students at private university

Gestión de la salud mental en medios de aprendizaje en línea durante la pandemia de COVID-19 para estudiantes de universidades privadas

Ade Irma Suryani[1a]*, Linardita Ferial[2b], Kustia Anggereni[3c], Febri Maryani[4a], Annysa Nur Mala Sari[5a]

SUMMARY

Introduction: *The Coronavirus Disease 2019 (COVID-19) pandemic has negatively impacted many sectors of people's lives worldwide, especially in the education sector. The COVID-19 pandemic in the education sector has disrupted students' mental health. This study aimed to determine and identify the impact of online learning during the COVID-19 pandemic on students' physiological and mental health.*
Methods: *This study used non-experimental with quantitative methods. It also used a descriptive survey research design. An instrument used in this study was the Self-Reporting Questionnaire (SRQ) with a Guttman scale for students in 2020. The research sample was 378 people using simple random sampling. The data analysis used in this study was univariate.*
Results: *Most respondents were 18-25 years (97.9 %). Based on the environmental conditions where students live in the red zone, 56.9 %. The distribution of students who experience mental health problems was 87 % of students experiencing psychotic symptoms, which was 90.2 %.*
Conclusion: *During the COVID-19 pandemic, students experienced quite high anxiety. More than half experienced the impact of COVID-19, and the experience of mental health problems is relatively high.*

Keywords: *COVID-19, mental health, students.*

RESUMEN

Introducción: *La pandemia de la enfermedad por coronavirus (COVID-19) ha impactado negativamente en muchos sectores de la vida de las personas en todo el mundo, especialmente en el sector de la educación. La pandemia de COVID-19 en el sector de la educación ha trastornado la salud mental de los estudiantes. Este estudio tuvo como objetivo determinar e identificar el impacto del aprendizaje en línea durante la pandemia de COVID-19 en la salud fisiológica y mental de los estudiantes.*
Métodos: *Este estudio utilizó métodos no experimentales con métodos cuantitativos. También*

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se utilizó un diseño de investigación descriptivo de encuesta. Un instrumento utilizado en este estudio fue el Cuestionario de Autoinforme (SRQ) con escala de Guttman para estudiantes del año 2020. La muestra de la investigación fue de 378 personas utilizando un muestreo aleatorio simple. El análisis de datos utilizado en este estudio fue univariado.

Resultados: *La mayoría de los encuestados tenían entre 18 y 25 años (97,9 %). Según las condiciones ambientales donde viven los estudiantes en la zona roja, el 56,9 %. La distribución de los estudiantes que experimentan problemas de salud mental fue del 87 % de los estudiantes que experimentaron síntomas psicóticos, que fue del 90,2 %.*

Conclusión: *Durante la pandemia de COVID-19, los estudiantes experimentaron una ansiedad bastante alta. Más de la mitad experimentó el impacto de COVID-19, y la experiencia de problemas de salud mental es relativamente alta.*

Palabras clave: *COVID-19, salud mental, estudiantes.*

INTRODUCTION

The Coronavirus Disease (COVID-19) pandemic is currently having a negative impact on many sectors of people's lives around the world (1-3). The health, food, manufacturing, tourism and education sectors were affected in several fields. This pandemic has a huge impact, making people panic (4-6). These are potentially threatening the mental health of children and adolescents significantly. This is associated with various physical effects, such as decreased motor activity, changes in eating habits, no sunlight exposure, and adverse psychological effects, such as stress, fear, anxiety, and depression. Anxiety, lack of contact with peers, and reduced opportunities for stress management are the main problems that lead to further mental disorders (7-9).

One of the major impacts that the changes in youth society have felt is the education sector, especially the teaching and learning process implementation. Various research surveys have been conducted to measure students' mental health levels worldwide. For example, a survey conducted by a previous study found that students in Bangladesh experienced high levels of anxiety, depressive symptoms, and low mental health status when facing various changes due to the COVID-19 virus in April 2020 (10). Research in China also revealed that due to COVID-19, as many as 24.9 % of students experienced high anxiety during the learning process (11). However, a study conducted at Mulawarman University in Indonesia examined that 16.5 % of students reported experiencing moderate to severe symptoms of depression, 28.8 % experienced moderate to severe anxiety symptoms, and 8.1 % experienced moderate to critical stress levels (12).

In early April, the Indonesian government established a strict policy through large-scale social restrictions to suppress the spread of COVID-19. Progressive steps were taken to limit the transmission of the virus through restrictions on people's movements. While learning from home is the only solution to keep the learning system running. Learning from home online is called e-learning. It is also conducted by the Televisi Republik Indonesia (TVRI) channel, which simultaneously broadcasts educational topics daily at every level of education (12,13). However, online learning is considered less enjoyable. It has many obstacles in its implementation due to the lack of adequate facilities individually and the low readiness of teachers, students, and parents. The results of the Child Protection Commission (KPAI) survey were students as respondents complained of many obstacles, including narrow task work time that makes students less rested and exhausted. Then, many students do not have adequate facilities such as laptops or mobile phones with proper specifications for online learning, teaching, and learning interactions, such as lost communication in the middle of lesson hours. There are no learning interactions such as questions and answers and explanations of material from the teacher.

The continuous online learning process is expected to decrease students' mental health. Various symptoms of decreased student mental health are known from the number of students who experience high anxiety levels. In addition, most students are also known to feel depressed due to the many assignments given by lecturers, which also causes them to lack time to rest (7,14,15). Furthermore, the COVID-19 pandemic has not yet been resolved. New clusters continue to emerge, which are increasingly causing unrest in the community. Thus, forcing government policies to continue means that the implementation of the teaching and learning process will continue to rely

on learning from the home system. Therefore, it has to be conducted until conditions are considered more stable and safer. For this reason, this study aims to investigate and identify the impact of online learning during the COVID-19 pandemic on the physiological effect and mental health of students at a private university.

METHODS

This type of research design was non-experimental. This study used a descriptive survey research design. The Self Reporting Questionnaire (SRQ) questionnaire was developed by World Health Organization (WHO) with the Guttman measuring scale. It was distributed to students at a university in Banten Province, Indonesia, from January-May 2020. The inclusion criteria in this study were 4th and 6th-semester students, active status as students. The sample size was 378 people with the purposive random sampling method. The type of data used was primary data. However, the dependent variable in this study was mental health and psychotic symptoms in students. The independent variables were age, gender, semester, class, education status, residence status, health status, and status of the restrictions on the community area. The instrument used was a questionnaire with 29 questions SRQ. Thus, this study did not test the validity and reliability because WHO has developed the SRQ with the Guffman measuring scale. The data analysis used in this research was univariate. The univariate analysis aimed to describe the characteristics of each variable. The distribution of the frequency and percentage of the variables was already applied (16). This research has been approved through an ethical review procedure and has received ethics pass letter from the University of Banten Jaya with letter number 0022-13.96/ LP3M-UNBAJA/I/2020.

RESULTS

The analysis showed that students' characteristics at private universities were seen by age, gender, semester, class, last education, income, living environment, health status, and regional status. Based on age, most of the respondents aged 18-25 years were 97.9 % and a small portion aged 26-32 years was 2.1 %. Besides that, the male gender was 57.9 %, and the rest was female, 42.1 %. Based on the semester level, most of the respondents were students from semester 4, which was 55.8 %. However, a small proportion were students in semester 6, 44.2 %. The largest batch frequency of respondents being students of the 2019 batch was 56.9 %. Then students from the class of the year 2018 were 42.9 %, and the least was from the class of 2017, which was 0.3 %. The last education of most of the respondents was senior high school, which was 78.6 %. However, bachelor and diploma 4 was 15.9 % and at least had the last education diploma three which was 5.6 %.

Judging from the condition of the family and place of residence, most of the respondents are students from families with an income of less than 1 million, which was 56.9 %, and the least were students from families with an income of more than 1 million, which was 43.1 %. While the environmental conditions where students lived in the red zone were 56.9 %, and the least were respondents who lived in the red zone, which was 43.1 %. Along with some respondents' health status, healthy people's health status was 80.4 %. The respondents with people without symptoms were 10,8 % in health status, people under surveillance 5.6 %, and at least respondents with the patient under supervision were 3.2 %. The conditions of restrictions on community activities status application in the area where the respondent lives were 55.6 %, and a small proportion of respondents who lived in areas that did not have community restriction status was 44.4 % (Table 1).

Based on Table 2, the distribution of mental health problems found that 87 % of students experienced health ≥ 5 with anxiety and depression symptoms. Psychotic symptoms experienced by students during the pandemic, it was found that most students experienced ≥ 1 psychotic symptom, which was 90,2 %, and a small proportion was normal, which was 9,8 %.

DISCUSSION

Based on the analysis results, it was found that most students experienced mental health

Table 1

Distribution of Student Characteristics

Student Characteristic	n	%
Age		
18-25 years old	370	97.9
26-32 years old	8	2.1
Sex		
Male	219	57.9
Female	159	42.1
Semester		
4th	211	55.8
6th	167	44.2
Years		
2017	1	0.3
2018	162	42.9
2019	215	56.9
Education		
High school/vocational school/Equivalent	297	78.6
Diploma Degree (D3)	21	5.6
Bachelor Degree	60	15.9
Living Environment (Red Zone)		
No	181	56.9
Yes	197	43.1
Health Status		
Patient Under Supervision	12	3.2
People Under Surveillance	21	5.6
People without symptoms	41	10.8
Healthy	304	80.4
Region status of Restrictions on Community Activities		
No	168	44.4
Yes	210	55.6

Table 2

Distribution of Student Mental Health Problems and Psychotic Symptoms

Variable	n	%
Mental health problems		
≥ 5 (mental health problems/neurotic symptoms)	329	87
< 5 (Normal)	49	13
Psychotic Symptoms		
≥ 1 (Psychotic Symptoms)	341	90.2
< 1 (Normal)	37	9.8
Total	378	100

problems or symptoms of neurosis, which resulted from not being optimal in attending lectures. However, this has resulted in a decrease in student achievement scores. Several factors influence the result, such as environmental conditions or student residences whose internet network connections are difficult to conduct e-learning during the COVID-19 pandemic, and the lack of maximum teacher delivery of material so that understanding of the material is not conveyed optimally by the teacher to students. Therefore, a student in mental health management needs to increase student achievement index scores. In addition, mental health efforts must be integrated, comprehensive, and sustainable by the government, local government, and the community. Data showed that symptoms of depression and anxiety indicate the prevalence of mental-emotional disorders at the age of > 15 years by 6.1 % of the total population of Indonesia, or equivalent to 11 million people (17).

Based on the results, it is explained that most respondents experienced mental health problems/symptoms of neurosis, and only a small proportion of respondents still had normal mental health. There are four signs of anxiety disorders: cognitive signs, emotional signs, physical signs, and behaviour (18). Cognitive signs include an inability to concentrate, memory problems, frequent negative thoughts, and constant worry. While emotional signs include feeling overwhelmed, moody, depressed, and irritable, the characteristics of physical disorders are symptoms of neurosis or mental disorders, namely headaches, constipation, digestive problems, chest pain, and dizziness. Behavioural signs include eating more or less, difficulty sleeping, overdoing activities such as exercising and shopping excessively, and suddenly having new habits that signal nervousness, such as nail biting or pacing, using illegal drugs, and consuming alcohol (19). Symptoms of mental health problems include depression, bipolar disorder, anxiety disorders, post-traumatic stress disorder, obsessive-compulsive disorder, eating disorders, addictions, and personality and schizophrenia disorders (20).

Students with psychotic symptoms have characteristics that cannot judge themselves and their surroundings and cannot judge themselves

and others. This happens a lot at the age of < 30 when the age is still productive. Based on data from a previous study stated that 48 % thought about committing suicide and intended to hurt themselves and others (21). They experience psychological trauma, such as feeling alert, alone, abandoned, and isolated. This happens because the pandemic impacts personal and family life, such as being laid off, income declining, businesses being out of business, and the high divorce rate. This affects students, especially at a private university. Those who usually gather with friends or lecturers for these discussions can no longer be limited online. As we know, in-person and online meetings have different meanings or values. Even during online lectures, lecturers cannot fully supervise or oversee student understanding, and sometimes they have network problems or insufficient quotas, and the information submitted is incomplete. They are given assignments with a certain dateline, which applies to almost all lecturers (22).

Students who do not understand the material and are required to complete assignments according to the dateline will be triggered to experience these psychotic symptoms starting from confusion, anxiety, and stress, then increasing. Not to mention the family problem, whose opinion decreased, which triggered the mental problem. These new students make them more anxious because everything is online at the beginning of entering campus. There are no offline campus orientation activities, so the network looking for classmates or seniors to be discussion partners is reduced. This condition can be prevented by online contact with friends or relatives and strengthening worship (23).

CONCLUSION

During the COVID-19 pandemic, students experienced quite high anxiety, and more than half experienced the impact of COVID-19. In addition, students who experience psychoticism are quite high. Therefore, it needs to be the concern of the campus for better learning and teaching process by prioritizing the availability of counseling and coaching time to be closer to the students, as well as paying attention to student workloads or assignments, especially students from regions that are not supported with good infrastructure.

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ARTÍCULO ORIGINAL

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Home contact support in prevention of transmission of tuberculosis in west Lombok based on the theory of the health belief model

Apoyo del hogar en la prevención de la transmisión de la tuberculosis en el oeste de Lombok basado en la teoría del modelo de creencias sobre la salud

Agus Supinganto[1a]*, Ni Ketut Metri[b], Irwan Budiana[2c], Suharmanto Suharmanto[3d]

SUMMARY

Introduction: *The high incidence of infectious Tuberculosis in the community is closely related to family and community participation. Prevention of transmission is an essential factor in controlling the spread of Tuberculosis. The purpose of this study was to find out the knowledge of household contacts in preventing tuberculosis transmission in West Lombok.*
Methods: *This type of research is descriptive exploratory with a cross-sectional study design and sampling technique using purposive sampling. Data collection was carried out from July to September 2019 with 165 respondents. Data analysis was carried out descriptively using licensed SPSS software to identify respondents' knowledge and prevention efforts.*
Results: *The research found that most of the support for household contacts in the prevention of transmission of Tuberculosis among respondents was 48.96 % with well-perceived susceptibility, 55.86 % with well-perceived seriousness, 57.59 % with good perceived benefits, 54.83 % with well-perceived barriers, 55.52 % with good cues to action.*
Conclusion: *It is necessary to increase the knowledge of family members about the prevention of Tuberculosis and implement a healthy lifestyle. Home contact support is needed to prevent the transmission of Tuberculosis based on the theory of health belief model.*

Keywords: *Home contact, knowledge, prevention, tuberculosis*

RESUMEN

Introducción: *La alta incidencia de la tuberculosis infecciosa en la comunidad está íntimamente relacionada con la participación familiar y comunitaria. La prevención de la transmisión es un factor esencial para controlar la propagación de la tuberculosis. El propósito de este estudio fue evaluar*

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el conocimiento de los contactos domésticos en la prevención de la transmisión de la tuberculosis en West Lombok.
Métodos: *Este tipo de investigación es de tipo exploratorio descriptivo con un diseño de estudio transversal y técnica de muestreo mediante muestreo intencional. La recolección de datos se llevó a cabo de julio a septiembre de 2019 con 165 encuestados. El análisis de datos se llevó a cabo de forma descriptiva utilizando el software SPSS con licencia para identificar el conocimiento y los esfuerzos de prevención de los encuestados.*
Resultados: *La investigación encontró que la mayor parte del apoyo a los contactos domiciliarios en la prevención de la transmisión de la Tuberculosis entre los encuestados fue 48,96 % con buena susceptibilidad percibida, 55,86 % con buena seriedad percibida, 57,59 % con buenos beneficios percibidos, 54,83 % con buenas barreras percibidas, 55,52 % con buenas señales de acción.*
Conclusión: *Es necesario incrementar el conocimiento de los familiares sobre la prevención de la Tuberculosis e implementar un estilo de vida saludable. Se necesita apoyo de contacto domiciliario para prevenir la transmisión de la tuberculosis según el modelo de creencias de la teoría de la salud.*

Palabras clave: *Contacto domiciliario, conocimiento, prevención, tuberculosis*

INTRODUCTION

Tuberculosis (TB) is a lung infection caused by the bacteria of mycobacterium tuberculosis. Tuberculosis is the leading cause of death due to infection (1). The prevalence of TB in the world in 2004 was 8.9 million, and in 2009 there were 9.4 million new cases due to TB (2-4). In 2018, Indonesia was one of the countries that accounted for 66 % of new TB cases, apart from India and China (5,6). Based on the results of basic health research in 2018, the prevalence of TB in West Nusa Tenggara Province is 0.32 %, with the proportion of patients who consume routine drugs in NTB Province at 54.9 % (7), while according to data from the Gunungsari Health Center, West Lombok, there were 58 tuberculosis patients in 2019 (8).

The main source of transmission is coughing or sneezing from smear-positive TB patients, where the patient spreads germs into the air in the form of droplet nuclei, as well as environmental factors related to the concentration of germs in the air such as ventilation, ultraviolet light and air filtering (9-12). Therefore, the house contact is the best person, being close to TB sufferers, to support the prevention of TB disease transmission. The results of previous studies show the incidence of TB in families who are known to have close contact with TB patients. However, apart from being the individual most at risk for TB, the family also has an important role in curing TB sufferers. The role of household contacts is shown in preventing TB transmission, including the supervision of taking medication, which this program is considered effective in curing TB sufferers (13-16).

The global TB report on prevention of transmission by involving the community is critical so that the targets set in the final TB strategy include a 90 % reduction in TB deaths and an 80 % reduction in TB incidence (new cases per year) by 2030 (17). Therefore, prevention of disease transmission by household contacts is essential in controlling TB disease transmission in the family and the community. Home contact support in preventing tuberculosis transmission is closely related to behaviour. The Health Belief Model (HBM) theory can be used to identify transmission prevention efforts carried out by household contacts of TB sufferers, given that the household contact is the closest community in efforts to control TB disease transmission. HBM theory explains why individuals take preventive measures based on individual perceptions of the disease they suffer. Based on the theory, the individual will feel threatened by the symptoms of the disease, so the individual will be quicker to seek help.

The amount of threat felt by the individual to the symptoms of the disease that occurs depends on the following factors: first, perceived susceptibility, that is, the individual feels at risk of disease, so the individual will perceive it as a threat and will take treatment action. Second, the perceived seriousness is how bad the individual perceives the consequences to be if they do not take treatment action. Third, perceived benefits, where individuals assess the benefits obtained if individuals take treatment. The fourth is perceived barriers, where the individual will assess himself whether taking medication causes unpleasant side effects, high costs, and whether it is difficult to obtain them. Next are cues to action,

which is a signal to take medical or preventive action (18,19).

The purpose of this study is to determine support for household contacts in the prevention of transmission of Tuberculosis through the HBM theory approach in West Lombok regencies.

METHODS

The type of research used was descriptive exploratory, which was to describe a situation or phenomenon, with a cross-sectional study design, which was a way of collecting data through questionnaires and measuring variables of age, ethnicity, latest education, occupation, type of family, perceived susceptibility, perceived severity, perceived benefits, perceived barriers and cues to action are carried out on one occasion. Therefore, each research object is observed only once. The population in this study were all household contacts of tuberculosis patients who were in West Lombok in 2019, as many as 290 people. The sampling technique used a non-probability sample with a purposive sampling method with the criterion for inclusion of household contacts for tuberculosis patients aged 18 years and over. Furthermore, this research has been approved by the Research Ethics Committee of Stikes Yarsi Mataram, West Nusa Tenggara, with Ethics Permit No: 7/KEP/STIKES/Y.III/VI/2019. The data collection tool for this study used a questionnaire that included statements about perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action regarding household contact support in preventing tuberculosis transmission. This questionnaire was adapted from previous standardized research. Questions about perceived susceptibility, perceived seriousness, perceived benefits, perceived barriers, and cues to action are each 10 statement items with alternative answers choosing answers using a 4-point Likert scale, namely strongly agree (score 4), agree (score 3), disagree (score 2) and strongly disagree (score 1). Furthermore, it is categorized as good if the score is 10-20, sufficient if the score is 20-30, and less if the score is 30-40. Data analysis was done descriptively by using licensed SPSS software.

RESULTS

Demographic data measured in this study include age, ethnicity, latest education, occupation, and type of family. The frequency distribution can be seen in Table 1 below:

Table 1

Demographic Frequency Distribution of Household Contacts of Tuberculosis Patients

Demographic Data	Frequency	Percentage
Age		
Young Adults	92	31.72
Middle Adult	156	53.79
Advanced Adults	42	14.49
Last education		
Low	112	38.62
Intermediate	173	59.65
High	5	1.73
Occupation		
Unemployed	20	6.89
Farm workers	172	59.31
Traders	56	19.31
Driver	9	3.10
Indonesian workers	1	0.34
Army/Police	1	0.34
Teachers / Educators	21	7.24
Tribes		
Sasak	281	96.89
Non-sasak	9	3.11
Family Type		
Nuclear family	180	62.06
Extended family	76	26.20
Single parent family	17	5.86
Single adult	17	5.86

Source: Primary Data (Processed 2019)

Table 1 shows that the highest age is in the middle adult age group (41-60 years) 156 people (53.79 %), the highest last education is secondary education as many as 173 people (59.65 %), the highest frequency of work is farm labour as many as 172 people (59.31 %), the biggest ethnic groups are Sasak as many as 281 people (96.89 %) and the largest type of family is nuclear family as many as 180 people (62.06 %).

Home contact support in the prevention of tuberculosis transmission was measured according to the mean value of each HBM variable. Each respondent was categorized as doing prevention of transmission and not taking prevention. The results of each variable in the questionnaire are as follows. In Table 2 can be seen that, of the 290 respondents, it was found that 142 respondents (48.98 %) supported the prevention of tuberculosis transmission. Meanwhile, 30 (10.34 %) did not provide support for the prevention of tuberculosis transmission.

Table 2

Frequency Distribution of Home Contact Support in The Prevention of Tuberculosis Transmission in West Lombok in 2019 (n = 290)

Variables	Frequency	Percentage
Prevention		
Good	142	48.96
Enough	118	40.68
Less	30	10.34
Perceived Susceptibility		
Good	162	55.86
Enough	114	39.31
Less	14	4.83
Perceived Seriousness		
Good	167	57.59
Enough	113	38.97
Less	10	3.45
Perceived Benefits		
Good	159	54.83
Enough	116	40.00
Less	15	5.17
Perceived Barriers		
Good	161	55.52
Enough	112	38.62
Less	17	5.86
Cues to Action		
Good	160	55.17
Enough	111	38.28
Less	19	6.55
Total	290	100.0

Source: Primary Data (Processed 2019)

Home contact support in preventing tuberculosis transmission in terms of perceived susceptibility found most of them in the good category to prevent transmission (55.86 %). For support for household contacts in preventing tuberculosis transmission in terms of perceived seriousness, most of the patients in West Lombok were in a good category (57.59 %). Home contact support in preventing tuberculosis transmission in terms of perceived benefits had the majority in the good category to support transmission prevention (54.83 %). In-home contact support in preventing tuberculosis transmission in terms of perceived barriers, most were in a good category to support transmission prevention (55.52 %). Finally, home contact support in preventing tuberculosis transmission in terms of cues to action found most the good category to support infection prevention (55.17 %).

DISCUSSION

Most of the respondents are in a good category, namely 55.86 %. This means that more than half of the respondents have a good perception of the susceptibility of the disease, thereby increasing their efforts to prevent tuberculosis transmission. Research conducted in Iran on self-efficacy education based on the Health Belief Model (HBM) in patients with type-2 diabetes found that, through tailored self-efficacy education, the quality of life and metabolic profile of diabetic patients can be improved (20). Individual perceptions in the behaviour of taking health measures are strongly influenced by perceived susceptibility. It appears to be the most significant factor in determining adherence (21,22). It was conveyed that the vulnerability felt by each individual in feeling how likely the tuberculosis disease they suffered would infect other people would affect their actions to prevent transmission so that, if the individual did not feel that Tuberculosis is a risk and a threat to him, so the individual will not seek treatment and take prevention. Regarding respondents in providing support for the prevention of tuberculosis transmission based on their perceived vulnerability, some of the actions are by recommending expelling phlegm in the bathroom toilet, always drying the mattress and opening the window every morning and knowing how to cough effectively. Most of the respondents know how to cough effectively, so

if they come across someone with a cough, they always recommend covering it with a sleeve or with a handkerchief. Doing the correct cough is the most effective way to reduce tuberculosis transmission to other people because respondents felt that the transmission of Tuberculosis could be prevented by being able to cough effectively in the family and the community. Therefore, respondents' perceived susceptibility perceptions affect the respondent's actions to support the prevention of tuberculosis transmission.

Home contact support in preventing tuberculosis transmission in terms of perceived seriousness in most respondents was in the good category with 57.59 %. This means that more than half of the respondents have a good perception of the severity of Tuberculosis. A study conducted on high school students in Shanghai, China, through community-based school health education had the greatest impact on perceived seriousness related to injuries among high school students after the intervention (23). Respondents, who were mostly men and young adults, felt that healing and reducing the transmission of family members are their concerns. Based on HBM theory, a systematic review was conducted to identify study interventions that used HBM as the theoretical basis for the intervention design. Out of 18 eligible studies, 14 (78 %) reported a significant increase in adherence (24).

According to the study results, most of the respondents were in a good category, namely 54.83 % support for household contacts in preventing tuberculosis transmission in terms of perceived benefits. These results indicate that more than half of the respondents have a good perception of the benefits they offer in supporting the prevention of tuberculosis transmission, affecting respondents in receiving and taking preventive measures. Officers who have run the TB program in West Lombok for more than five years can provide information to respondents about the impact of transmission on the family, leading respondents to be increasingly aware of the importance of supporting transmission prevention programs in the family and the community. The ability of officers to increase respondents' knowledge is following a study that found that officers still of productive age will always carry out promotions in the community (25). From the description above, it can be concluded that the perception of perceived benefits in preventing tuberculosis recurrence is one factor that can influence respondents to prevent tuberculosis transmission. Conversely, the low perception of perceived benefits can also be an inhibiting factor in choosing preventive measures.

Support for household contacts in preventing tuberculosis transmission in terms of perceived barriers in most respondents was in a good category, namely 55.52 %. This means that more than half of the respondents have a good perception of the obstacles in supporting the prevention of tuberculosis transmission, thus motivating individuals to prevent transmission in the family environment and the community. The HBM theory states that a high perception of perceived barriers to taking preventive action can significantly affect the low willingness of individuals to take such measures. This is because several studies have shown that the extent of perceived barriers significantly impacts the HBM dimension in explaining or predicting a lack of health-maintaining behaviour. Based on the description above, it can be concluded that the higher the perception of perceived barriers, the less likely the individual is to take action to prevent tuberculosis recurrence. Conversely, if individuals have a low perception of perceived barriers, the individual is more likely to take prevention.

In-home contact support in preventing tuberculosis transmission in terms of cues to action, most respondents were in a good category, 55.17 %. This means that more than half of the respondents have good signals regarding support for preventing tuberculosis transmission. Cues to action are stimuli that motivate individuals to take action following health behaviours (26). Cues to action are triggering factors in deciding whether to accept or reject alternative preventive measures. These cues can be internal, namely, from within the individual, for example, the symptoms that are felt, and externally from interpersonal interactions such as mass media, messages, advice, suggestions, or consultations with health workers. To get the correct level of acceptance regarding the vulnerability, gravity, and benefits of action, signals in the form of external factors are needed. The encouragement that comes continuously from the people concerned will likely have a big influence in deciding to take

measures to prevent tuberculosis transmission. External factors influencing respondents in initiating transmission prevention measures consist of suggestions from health workers, family recommendations, and information from the mass media. These factors influence respondents' perceptions of the importance of preventing tuberculosis transmission through consideration of the susceptibility and severity of Tuberculosis and the benefits and threats that arise if prevention is not carried out. Furthermore, the existing external factors are influenced by education, marital status, and knowledge. This refers to a person's perception as influenced by the frame of reference, which is the framework of knowledge obtained from education, observation, or reading and is also influenced by the information or stimulation that is first obtained.

CONCLUSION

Home contact support in preventing tuberculosis transmission in terms of perceived susceptibility is mostly in the good category. Regarding perceived seriousness, most are in a good category, the same for perceived benefits, perceived barriers, and cues to action. In relation to this research, the writer recommends that public health centers in West Lombok, especially health workers, be able to fully involve the role of religious leaders, community leaders, and groups in the community in providing education about the prevention of tuberculosis transmission.

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Self-efficacy and COVID-19 prevention behaviour among adolescents: A cross-sectional study

Autoeficacia y comportamiento de prevención de COVID-19 entre adolescentes: un estudio transversal

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SUMMARY

Introduction: *COVID-19 has become a serious epidemic in Indonesia, even in the corners of the earth. Every day COVID-19 patients continue to increase, and almost all circles of society are exposed to the virus regardless of age and gender. In dealing with conditions such as the current pandemic, it is necessary to have self-efficacy in good adolescent prevention practices. The purpose of this study was to determine the relationship between self-efficacy and the practice of preventing COVID-19 in adolescents.*
Methods: *A descriptive correlational study was conducted among 232 senior high school students in Lumajang, Indonesia. Quota sampling was used to recruit the respondents. The data were collected using general self-efficacy and COVID-19 preventive behaviour among adolescents. The univariate analyses in the form of frequency and percentage. Furthermore, bivariate analyses with the Spearman Correlation Test were performed for data analysis.*
Results: *The results of this study indicate that the majority of Persatuan Guru Republik Indonesia (Indonesian: Teacher's Union of the Republic of Indonesia) (PGRI) high school students' self-efficacy levels are in the moderate category, with a total of 120 (51.7 %), while most COVID-19 prevention practices are 129 respondents (55.6 %). The results of the Spearman correlation test show a positive relationship between self-efficacy and the practice of preventing COVID-19, as evidenced by a significant value of 0.0001 ($p<0.05$) and a correlation value of 0.903. The strength of relationship in this study is strong.*
Conclusion: *High self-efficacy can affect prevention practices that can be done well because the higher self-efficacy, the person could act with confidence and be more careful in acting, for example, such as carrying out preventive practices to reduce the transmission of COVID-19. Strategies to improve self-efficacy may be beneficial in increasing positive behaviour toward COVID-19.*

Keywords: *COVID-19, preventive practices, self-efficacy.*

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RESUMEN

Introducción: *La COVID-19 se ha convertido en una grave epidemia en Indonesia, incluso en los rincones de*

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la tierra. Cada día siguen aumentando los pacientes de COVID-19, y casi todos los círculos de la sociedad están expuestos al virus sin importar la edad y el género. Ante condiciones como la actual pandemia, es necesario tener autoeficacia en buenas prácticas de prevención adolescente. El propósito de este estudio fue determinar la relación entre la autoeficacia y la práctica de prevención del COVID-19 en adolescentes.
Métodos: *Se realizó un estudio descriptivo correlacional entre 232 estudiantes de secundaria en Lumajang, Indonesia. Se utilizó el muestreo por cuotas para reclutar a los encuestados. Los datos fueron recolectados utilizando la autoeficacia general y el comportamiento preventivo de COVID-19 entre adolescentes. Los análisis univariados en forma de frecuencia y porcentaje. Además, se realizaron análisis bivariados con la prueba de correlación de Spearman para el análisis de datos.*
Resultados: *Los resultados de este estudio indican que la mayoría de los niveles de autoeficacia de los estudiantes de secundaria del Persatuan Guru Republik Indonesia (Indonesio: Sindicato de Maestros de la República de Indonesia) (PGRI) se encuentran en la categoría moderada, con un total de 120 (51,7 %), mientras que la mayoría de las prácticas de prevención del COVID-19 son 129 encuestados (55,6 %). Los resultados de la prueba de correlación de Spearman muestran una relación positiva entre la autoeficacia y la práctica de prevención del COVID-19, evidenciada por un valor significativo de 0,0001 (p<0,05) y un valor de correlación de 0,903. La fuerza de la relación en este estudio es fuerte.*
Conclusión: *La alta autoeficacia puede afectar las prácticas de prevención que se pueden hacer bien porque a mayor autoeficacia, la persona podría actuar con confianza y ser más cuidadosa al actuar, por ejemplo, como realizar prácticas preventivas para reducir la transmisión de COVID-19. Las estrategias para mejorar la autoeficacia pueden ser beneficiosas para aumentar el comportamiento positivo hacia el COVID-19.*

Palabras clave: *COVID-19, prácticas preventivas, autoeficacia.*

INTRODUCTION

COVID-19 remain a global threat that causes mortality and morbidity among global citizen (1). The country with the highest COVID-19 cases is the United States, with the number of confirmed cases as of April, 357 036 out of 1.2 million more infected worldwide. Meanwhile, China, the first transmission of COVID-19, was the fifth country with the highest number of COVID-19 cases, with a total of 83 654. In Southeast Asia, the country with the highest number of deaths in Malaysia. As of April 10, 2020, the total number of cases that have been confirmed positive is 4 228, with 67 patients dying and 1 608 recoveries (2). On May 8, 2020, the number of cases due to COVID-19 was 3 679 499 people, and 254 776 people died in 215 countries (3). Indonesia with a total of 12.776 COVID-19 cases and a total of 930 people who died (4).

Indonesia was in 3rd place in Southeast Asia on April 10, 2020, with a total of 3 293 confirmed positives, a death rate of 280 patients, and 252 patients with total deaths having recovered. DKI Jakarta ranked highest in Indonesia with valid COVID-19 cases on April 10, 2020, and there were 1 706 patients with a total death of 154 patients (2). According to information on the COVID-19 in East Java, as many as 14 941 people tested positive for COVID-19, people under monitoring (ODP) reached 30 516, patients under surveillance (PDP), as many as 11 923 people, patients who have recovered 5 779 people (5). In Lumajang District, East Java Province, 686 people were confirmed positive for COVID-19, 621 people recovered, and 63 patients died (6).

As a result, COVID-19 has made all activities that initially brought together many people now limited physical, and social contact, such as learning at school, which was initially carried out face-to-face to online learning (online learning), and workers are working from home, so worship is currently allowed. Stay at home (7-10). This is certainly felt by children when learning online (online), which is caused by a lack of mastery of technology, and limited internet costs for communication and socialization between teenagers and their teachers (11-13). Adolescence can be said to be a transition period from childhood to adulthood with the age of 12 to 15 years, even up to 20 years. Changes in adolescence include physical changes, mindsets, personality, and behaviour, and identity development will continue to run in adolescence (14-16). During the transition period, full of temptations, teenagers often experience emotions, anxiety, and discomfort.

Therefore, teenagers must go through and accept all the changes around them to adapt well (7). Distance learning implemented during the pandemic period requires adaptation for

teenagers because previously, they met face-to-face and could interact more freely, but during the pandemic period, teenagers need time to adapt to new changes that affect their ability to understand learning materials. In addition, during the pandemic, teenagers have a period of vacation that cannot be determined when it will end, making them feel bored (11).

Preventive action is an effort to eliminate potential causes or unexpected situations implemented in health services and the community. Preparedness must be developed among teenagers against COVID-19 because young people are familiar with and good at using social media to get information about COVID-19 knowledge. Preparedness is a person's readiness to deal with problems or disasters that come and carry out various kinds of effective prevention (17). The prevention practices that adolescents commonly carry out in the community are following guidelines for washing hands properly, spraying disinfectants, utilizing media platforms to support public health communication, social media campaigns, and school communication can be effective methods for students to receive appropriate information. with age (18). Teenagers must have adequate knowledge during the COVID-19 pandemic even though they are not at high risk of being infected with the COVID-19 virus. Using information facilities such as newspapers, TV, and government directives effectively is the key to increasing public knowledge and awareness about COVID-19 virus infection and its consequences (19,20).

Effective management is by applying Self Efficacy to adolescents for COVID-19 prevention practices. Self-Efficacy is a general concept that refers to the extent to which people believe that they can overcome problems or stressors that are being experienced and require the ability to control motivation Self-efficacy also requires beliefs about the ability to have a direct influence on the actions taken and how much effort has been passed as well as how long he refuses to take preventive action (19).

In addition, adolescents have low self-efficacy because when faced with problems, they have fewer coping strategies compared to adults, as is the case during the current COVID-19 pandemic; therefore, it is essential to support adolescents during difficult times and build their mental health so as not to be disturbed (1,21). A preliminary study found high rates of depression (23 %), anxiety (19 %), and (52 %) experiencing moderate levels of worry (22). Therefore, the purpose of this study is to find out the relationship, namely so that adolescents have self-defence for themselves and can carry out activities or activities normally even though they are still in the scope of the COVID-19 pandemic. Based on the above review, the researcher wants to conduct a study entitled "The Relationship between Self-Efficacy and COVID-19 Prevention Practices in Adolescents".

METHODS

Research design

This research used a descriptive-analytic research method with a cross-sectional approach. This study used quota sampling with a sample of 232 students at Senior High School in Lumajang District, East Java Province, Indonesia. The inclusion criteria were willing to be participants. Data were collected using a questionnaire that had been translated into Indonesian.

Self-Efficacy

In this study, using the General Self-efficacy Scale (GSE) questionnaire, the researchers took a questionnaire from the research (23). This research instrument consists of 10 questions with answer choices strongly disagree, disagree, agree, and strongly agree. Then for the category of assessment based on the score is low: < 20, moderate: 20 – 30, and high: 30. The reliability test results show the Cronbach alpha is 0.923.

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Preventive Practice

To prevent COVID-19, researchers adopted a questionnaire from the journal preventive behaviors related to COVID-19 among high school students: a cross-sectional web-based survey consisting of 10 question items. This questionnaire uses an attitude questionnaire consisting of 3 components of clean and healthy

living behaviour: applying masks during the COVID-19 pandemic, implementing social distancing, and regularly washing hands properly and correctly. In addition, a modified Likert Scale measured preventive behaviour related to the COVID-19 score. Preventive behaviour related to the COVID-19 score is categorized as good if the total score reaches more than 75 %, moderate if it is equal to 75 %, and poor if the total score only reaches 75 % or less (24). The results of the reliability test show Cronbach's alpha are 0.802.

Data analysis

This study measures the relationship between self-efficacy and the practice of preventing COVID-19 in adolescents. Using the Spearman Correlation test, the bivariate test was conducted to determine the relationship between self-efficacy and the practice of preventing COVID-19 in adolescents.

Ethical consideration

The research ethics was obtained from the UMM Ethics Committee from the University of Muhammadiyah Malang (No.E.5.a.006/KEPK-UMM/I/2022).

RESULTS

Table 1 shows that the results of the characteristics of respondents based on gender obtained the most are women, namely 137 (59.1 %) respondents. The age in the table shows that most respondents are 16 years old, with a total of 102 (44 %) people. Then the results of the most class characteristics are class XI with 118 (50.9 %) respondents.

The results of the self-efficacy description of 232 respondents showed that most respondents had moderate self-efficacy with a total of 120 (51.7 %) respondents (Table 2).

Table 3 shows that 129 (55.6 %) respondents have moderate prevention practices from the number of respondents as many as 232 people.

Table 1

Characteristics of respondents

Characteristic	Frequency (n)	Percentage (%)
Gender		
Male	95	40.9
Female	137	59.1
Age (Years)		
15	23	9.9
16	102	44.0
17	95	41.0
18	8	3.4
19	4	1.7
Class		
X	114	49.1
XI	118	50.9
Total	232	100.0

Table 2

Self-Efficacy Level Among Senior High School Students About COVID-19

Category	Frequency	Percentage (%)
Low	17	7.4
Moderate	120	51.7
High	95	40.9
Total	232	100.0

Table 3

Level of Preventive Practices for PGRI 1 Lumajang Senior High School Students About COVID-19

Category	Frequency	Percentage (%)
Poor	8	3.4
Moderate	129	55.6
Good	95	40.9
Total	232	100.0

As shown in Table 4, the cross-tabulation results of 232 respondents showed that adolescents' self-efficacy during the COVID-19

pandemic had moderate self-efficacy with a total of 120 students. While the results of the cross-tabulation of preventive practices during the COVID-19 period, most adolescents had moderate prevention practices, with a total of 129 students.

Table 4

Cross Tabulation Between Self-Efficacy with Preventive Practices COVID-19

			Preventive Practices			Total
			Poor	Moderate	Good	
Self-Efficacy	Low	n	8	6	3	17
		%	3.4	2.6	1.3	7.3
	Moderate	n	0	120	0	120
		%	0.0	51.7	0.0	51.7
	High	n	0	3	92	95
		%	0.0	1.3	39.7	40.9
Total		n	8	129	95	232
		%	3.4	55.6	40.9	100

The results of the Spearman correlation test between self-efficacy and prevention practices obtained a correlation coefficient of 0.903 with a significant value of 0.0001. These results indicate a value of less than 0.05 ($p < 0.05$). There is a significant relationship between self-efficacy and prevention practices. Furthermore, the strength of the relationship is very strong, i.e. $r = 0.903$, and positively correlated, which means that the higher the level of self-efficacy in adolescents, the better prevention practices implemented by adolescents during the COVID-19 pandemic (Table 5).

Table 5

The Relationship Between Self-Efficacy and COVID-19 Prevention Practices in Adolescents

			Self-Efficacy	Preventive
Spearman's rho	Self-efficacy	Practices Correlation Coefficient	1.000	0.903**
		Sig. (2-tailed)		0.0001
		N	232	232
	Prevention practices	Correlation Coefficient	0.903**	1.000
		Sig. (2-tailed)	0.0001	
		N	232	232

DISCUSSION

The factors influencing a person's high and low self-efficacy in tasks vary widely. This is caused by several factors that affect the perception of individual abilities, including gender, age, education level, and experience (25). In this study, adolescents had a moderate level of self-efficacy, with the number of respondents

as many as 120 (51.7 %) students. Several studies state that self-efficacy is very important for students to do their study assignments and deal with situations or conditions. However, in reality, many students still have low self-efficacy because they lack self-confidence and believe in their ability to deal with problems that are being experienced or are happening (26). Students who have low self-efficacy will only be passive and wait for the COVID-19 pandemic to end soon and do not try to improve their ability to adapt to a condition or learning process that is currently happening. During the developmental period, adolescents who have moderate self-efficacy tend to be hesitant in making decisions related to their future and still focus on their goals in the present. Adolescents with high self-efficacy will be more sensitive to some new information, such as the prevention of COVID-19 and about the world of work or career, so they can plan and visualize the desired future (27). In contrast, students with high self-efficacy in research (18) aid that students were able to overcome problems, keep positive thinking, and think creatively in dealing with problems or conditions being faced, including during the COVID-19 pandemic.

The results obtained on prevention practices carried out by students during the COVID-19 pandemic, the majority had moderate prevention practices with a total of 129 (55.6 %) students, good prevention practices with as many as 95 (40.95 %) students, and bad prevention practices. as many as 8 (3.4 %) students. Practice is an action whose main element is an attitude, but attitude cannot necessarily be realized in action (28). Factors that influence practice include reinforcing factors (self-support), predisposing factors (knowledge, attitudes, actions), and enabling factors (facilities and infrastructure) (28). Research conducted by a previous study at Tasikmalaya, also said that some teenagers still cannot carry out preventive practices against COVID-19 properly or practice moderately because they lack a sense of concern for paying attention to health protocols (29). Even though you already know that washing your hands with soap is recommended, cover your mouth when sneezing and coughing. However, many students are reluctant to carry out these healthy habits to comply with health protocols to protect the environment so that they are not easily exposed to the COVID-19 virus. Some teenagers are said to have low practice because there are still those who imitate the hygiene behavior of their parents but are not accompanied by an understanding of the benefits for themselves and the surrounding environment, so it is necessary to deliver health information with specific targets for adolescents to strengthen understanding and maximize compliance. Adolescents who have a high level of practice because they have received information on knowledge and behavior of prevention well, they have compliance with practicing proper and clean hand washing. In a study (Chen et al., 2020) it was said that adolescent girls were more obedient to the recommendations for hand washing and did not want to take the risk of the impact of COVID-19 compared to male adolescents who were still unable to comply with the importance of washing their hands (30).

Spearman correlation test is a test that aims to determine whether there is a relationship between knowledge and attitude. Improving prevention practices implemented by teenagers during the COVID-19 pandemic. The practice of preventing COVID-19 can be driven by many factors, one of which is self-efficacy (31). Bandura describes that self-efficacy determines how people feel, think, motivate themselves, and behave (32). Research by Garrod, Marshall, dan Jones shows that self-efficacy is essential in individual decisions to take preventive action against the disease (33). Self-efficacy and prevention practices are important in preventing COVID-19 in adolescents because self-efficacy plays a positive role for adolescents during the COVID-19 pandemic in maintaining optimism and mental health (21). Another study reported that perceived self-efficacy has a positive and significant correlation to cues to action (34).

There are still many students who have low self-efficacy because they lack self-confidence and believe in their ability to deal with problems that are being experienced or are happening (26). Therefore, this study obtained results if students have moderate self-efficacy as many as 129 students and moderate practice as many as 120 students. Even though they have moderate self-efficacy, this level is above. Therefore, it is still categorized as good because students are still trying to pay attention to the problems that are currently happening. Faced and trying to get through also learn to solve a difficult condition.

CONCLUSION

In conclusion, more than half of students' self-efficacy levels regarding COVID-19 are moderate. The level of Student prevention practices regarding COVID-19 is moderate. There was a relationship between knowledge and attitude, the results were that there was a positive relationship between self-efficacy and the practice of preventing COVID-19 in adolescents. A person's ability to act with confidence and with greater caution can be influenced by their level of self-efficacy. For instance, carrying out preventive measures to lessen the transmission of COVID-19 can be affected.

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Comparison of knowledge of mothers with stunted and severely stunted toddlers before and after education with brainstorming and audiovisual methods

Comparación del conocimiento de las madres con niños pequeños con retraso del crecimiento y con retraso del crecimiento severo antes y después de la educación con lluvia de ideas y métodos audiovisuales

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SUMMARY

Introduction: *Stunting is the incidence of malnutrition, especially in toddlers, that lasts a long time. Stunting has several impacts, including an increased risk of morbidity in the form of an increased risk of occurrence and mortality that the incidence of infection can cause. This study used brainstorming and audiovisual methods to compare the knowledge of mothers who had stunted and severely stunted toddlers before and after being given a video.*
Methods: *This research method used a cross-sectional experimental study. The sample used in this study was 35 mothers with stunted and severely stunted toddlers that fulfilled the inclusion and exclusion criteria. Brainstorming and knowledge are done by audiovisual methods. Knowledge before and after brainstorming was analyzed by the Wilcoxon test.*
Results: *The Wilcoxon test showed significant differences in knowledge between pre-test and post-test, before and after education with brainstorming and audiovisual methods in mothers who had stunted/severely stunted toddlers, with the p-value <0.05.*
Conclusion: *Brainstorming methods and audiovisual media can be used to educate mothers with stunting children. Mother knowledge about stunting leads to optimal handling of children's growth and development.*

Keywords: *Audiovisual, brainstorming, knowledge, stunting.*

RESUMEN

Introducción: *El retraso del crecimiento se debe a la incidencia de la desnutrición, especialmente en los niños pequeños, que se prolonga durante mucho tiempo. El retraso en el crecimiento tiene varios impactos, incluido un mayor riesgo de morbilidad en forma de un mayor riesgo de aparición y mortalidad debido a la incidencia de infección. Este estudio utilizó la lluvia de ideas y métodos audiovisuales para comparar el conocimiento de las madres que tenían niños pequeños con retraso en el crecimiento y retraso en el crecimiento severo antes y después de ver un video.*
Métodos: *Esta investigación utilizó un estudio experimental transversal. La muestra utilizada en este estudio fue de 35 madres con niños pequeños con retraso del crecimiento y retraso del crecimiento severo que cumplían con los criterios de inclusión y exclusión. La lluvia de ideas y el conocimiento se realizan por métodos audiovisuales. El conocimiento*

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antes y después de la lluvia de ideas se analizó mediante la prueba de Wilcoxon.
Resultados: *La prueba de Wilcoxon mostró diferencias significativas en el conocimiento entre el pre-test y el pos-test, antes y después de la educación con lluvia de ideas y métodos audiovisuales en madres que tenían niños pequeños con retraso en el crecimiento/retraso severo, con el valor de p <0,05.*
Conclusión: *Los métodos de lluvia de ideas y los medios audiovisuales se pueden utilizar para educar a las madres con niños con retraso del crecimiento. El conocimiento de la madre sobre el retraso en el crecimiento conduce a un manejo óptimo del crecimiento y desarrollo de los niños.*

Palabras clave: *Audiovisual, lluvia de ideas, conocimiento, enanismo.*

INTRODUCTION

Stunting is the impaired growth and development children experience from poor nutrition, repeated infection, and inadequate psychosocial stimulation (1). Children are defined as stunted if their height-for-age is more than two standard deviations below the World Health Organization (WHO) child growth standards median (2). Stunting results from chronic and recurrent malnutrition refers to a child who is too short for their age, leading to the failure to grow physically and cognitively. Length and height are the best predictors of chronic malnutrition/ stunting. Stunting is defined as length/height for age more than two standard deviations below the median reference of the population. The effects of stunting are devastating that can last a lifetime. It prevents children from reaching their full physical and mental potential (3-5). A child is said to be stunted if the age z- score index height is <-2 standard deviations (SD) and severely stunted in <-3 SD. One of the causes of stunting is malnutrition in terms of quality and quantity, high morbidity, or a combination of both. This situation is common in countries with poor economic conditions (6,7).

Stunting is a picture of an incidence of malnutrition, especially in toddlers, that lasts a long time and stunting has several impacts, including an increased risk of morbidity in the form of an increased risk of morbidity and also mortality caused by infection events. However, stunting can also cause cognitive and behavioural disorders in children who tend to have lower socioeconomic status later in life due to decreased productivity (8-11). Thus, growth has not been maximized naturally by approximately 8.9 million Indonesian children or one in 3 Indonesian children. Indonesia has a higher number of stunting than other Southeast Asian countries such as Myanmar (35 %), Vietnam (23 %), and Thailand (16 %). Indonesia is ranked fifth in the world for the number of children with stunting. More than 1/3 of toddlers under five years old in Indonesia are below the standard height. Basic Health Research Riskesdas 2018 in Indonesia, as many as 30.8 % of toddlers, have short experience stature. Previously, the 2013 Basic Health Research showed that the national stunting number was 37.2 %, in 2010 (35.6 %) and 2007 (36.8 %) showed an increase (12,13).

Prevention of stunting rate has been carried out with efforts to increase the knowledge of mothers with toddlers experiencing stunting. This effort is carried out to cut or prevent further toddlers from experiencing stunting. A study stated that one of the healthy methods that can be used is the brainstorming method. In this method, all participants are asked to contribute ideas, insights, and experiences to find a way out of a problem. The discussion results in ideas, insights, and experiences being accommodated and then poured into a mindmap to make learning easier to understand without judging personal thoughts (14,15).

The study explained that some of the advantages of brainstorming include making participants more active in voicing ideas, practicing quick and logical thinking, making participants always ready to give opinions on a problem, increasing motivation of participants, making friends as learning media, healthy competition, a learning atmosphere that is not monotonous. Aside from the advantages, there are also weaknesses in short learning, making participants think not thoroughly. When there are participants who experience delays in learning, information is not conveyed properly. The topic of discussion in learning must be understood by listeners. If the teacher does not provide conclusions, it can confuse participants, and participants need time to find out the right and wrong in a statement. Meanwhile, the media that is often used to support learning is audiovisual media. Audiovisual media

helps to balance hearing and vision in capturing information (16-18). The use of audiovisual media intends to assist participants in absorbing the information conveyed because it involves the senses of hearing and vision. This can be related to the actual situation. Then the video is also dynamic and forms an impression that involves emotions (19-21). Based on the review above, the researcher is interested in researching the effect of stunting education using brainstorming and audiovisual methods on the knowledge of mothers using stunting toddlers.

METHODS

Research Design

This research design used a quasi-experimental type of research. The research design used was a one-group pre-post test design. This design was measured using a pre-test conducted before treatment, and a post-test carried out after each learning series. Thus the results of the treatment can be more accurate. The one-group pre-post test design scheme is shown as follows: the researcher used questionnaires to collect data that respondents had filled out. This approach was carried out to compare stunting education using brainstorming and audiovisual methods on the knowledge of mothers who had stunted and severely stunted toddlers.

Population and Research Sample

The population in this study were all mothers who had stunted and severely stunted toddlers. The consecutive sample in this study was 35 mothers. The inclusion criteria in this study were mothers with stunting toddlers, willing to be respondents, and in good mental condition. The exclusion criteria in this study were mothers with stunting toddlers who were physically and mentally ill, uncooperative, and had the hearing and vision impairments.

Data analysis

Test analysis using different paired mean (pair test) if the data is normally distributed. The normality test uses Shapiro-Wilk. The study used Wilcoxon Test analysis.

Ethical Consideration

This research was approved by Medical Research Ethic Committee - Medical College of Wijaya Kusuma Surabaya Universitas No 82/ SLE/FK/UWKS/2021.

RESULTS

The data used in this study were primary, namely pre-questionnaire and post-questionnaire, and secondary data with a sample of 35 respondents. This study showed (Table 1) that mothers who had stunted and severely stunted toddlers aged <30 years were 21 (60 %), aged between 31-45 years old were 9 (26 %), and those aged >45 years old were 5 (14 %). In addition, the results showed that most of the mothers with stunted and severely stunted toddlers with the latest education of elementary-junior are 5 (14 %), high school education is 27 (77 %), and mothers with a diploma and undergraduate education are 3 (9 %). In addition, the majority of mothers with stunted and severely stunted toddlers who work as housewives are 29 (83 %), entrepreneurs are 2 (5 %), and private employees are 4 (12 %).

Table 1

Characteristic of Mother Who Had Stunted and Severely Stunted

Characteristics of Mother's	n	%
Mother's age		
< 30 years	21	60
31-45 years	9	26
>45 years old	5	14
Maternal Education		
Elementary-Junior High School	5	14
Senior High School	27	77
College	3	9
Mom's Job		
Housewife	29	83
Entrepreneurial	2	5
Private	4	12
Civil servants	0	0
Total	35	100

Knowledge analysis between before and after the education of mothers who had stunted and severely stunted toddlers can be seen in Table 2.

Table 2

Knowledge analysis between before and after education

Knowledge	Pre-test		Post-test		p-value
	n	%	n	%	
Very good	22	62.9	31	88.6	0,005
Good	13	37.1	4	11.4	
Total	35	100.0	35	100.0	

Table 2 showed significant knowledge differences between pre-test and post-test before and after education with brainstorming and audiovisual methods in mothers who had stunted/ severely stunted toddlers, with the p-value <0.05.

DISCUSSION

Stunting is the impaired growth and development children experience from poor nutrition, repeated infection, and inadequate psychosocial stimulation. Children are stunted if their height-for-age is above two standard deviations below the WHO child growth standards median. Height under normal circumstances will increase along with age. Growth in height, unlike weight, is relatively less sensitive to malnutrition in a short period. The effect of nutritional deficiency on height will appear for a relatively long time and can describe toddlers' nutritional status (2). A mother who is too young or too old during pregnancy can cause stunting in children. Too young mothers are usually not ready for pregnancy and do not know how to maintain and care for pregnancy. Meanwhile, mothers who are too old usually have decreased stamina and enthusiasm for caring for their pregnancy (22).

The level of education affects a person in receiving information. Mothers with better levels of education will be easier to receive information than people with lower education levels. This information is used as a provision for mothers to take care of their toddlers daily. This study showed that there are many higher educated mothers whose toddlers are stunted and severely stunted. This phenomenon can happen because mothers' education is not the only factor causing stunting. Many other factors can affect stunting. This study's results align with research conducted in North Pontianak and Yogyakarta, Indonesia, where there was no significant relation between stunting, nutritional status, and mother's education level. This is because mothers' education does not guarantee more knowledge related to nutrition, but willingness, active health promotion, and active counseling are carried out by cadres, midwives, or doctors (3,8,23).

The results showed that most mothers with stunted and severely stunted toddlers work as housewives. These results show that stunting occurs in mothers who do not work. This could be due to poor parenting and an unsupportive environment. Parenting by mothers has a role in the incidence of stunting in toddlers because the mother fully manages food intake in toddlers. Therefore, mothers with good parenting will tend to have toddlers with better nutritional status than mothers with poor parenting. However, in this study, mothers with good parenting did not necessarily have toddlers with smaller stunting problems than mothers with poor parenting. This could be because even though the mother's parenting style is good, poor families have limitations in fulfilling their daily needs. A good parenting style must also be supported by adequate socioeconomic support to fulfill toddlers' needs (8,9).

The results explain that there is an increase in mothers' knowledge before education with brainstorming and audiovisual methods and after education with brainstorming and audiovisual methods. Education using the brainstorming method has the advantage that all members can express their opinions and stimulate them to think critically and participate in health education. In this method, respondents get the information through group discussions, and all respondents have the right to express their opinions without any objection from anyone. The brainstorming method can also trigger respondents to think actively and share so that communication between respondents can create a pleasant

atmosphere (24). The brainstorming method can improve memory and train participants to think and improve concentration, attention, and understanding. This method can also increase participants' confidence when expressing their opinions because expressing opinions or speaking in front of a crowd requires courage. One of the media that can be used for education is audiovisual media. Audiovisual media can help participants stimulate the senses of hearing and vision during the health education process (20). Using audiovisual media can make it easier for participants to receive the material presented because it can activate the sense of hearing and vision of the participants so that they can connect theory with reality. Using audiovisual media in the form of video has the advantage that it can describe the situation according to the existing reality. The video is also dynamic to give the impression and stimulate the participants' emotions (25,26).

CONCLUSION

There are significant differences in mothers who had stunted and severely stunted toddlers before and after education with brainstorming and audiovisual methods. Therefore, this study suggests more health education about stunting prevention and early detection by using brainstorming methods and audiovisual media and monitoring mothers' knowledge and attitudes towards stunting after the intervention. Likewise, important education about handling and parenting so that stunting does not occur in their children so that optimal growth and development are achieved.

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Sustainable services for the elderly in Malang city: A qualitative study

Servicios sostenibles para personas mayores en la ciudad de Malang: Un estudio cualitativo

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SUMMARY

Introduction: *The continuity of various health services, such as hospitals and health centers, is needed to maintain the quality of care for the elderly. This study aimed to explore service providers' role in sustainable services for the elderly.*
Methods: *This study used a qualitative method to explore sustainable services for the elderly. The research participants totalled 16 people, namely primary and secondary informants. The researcher uses Focus Group Discussion (FGD) guidelines to become his own research instrument. The analysis in this study used Thematic Analysis.*
Results: *The results were obtained from 6 themes. The themes consist of: (1) Obstacles in the screening of elderly health, (2) The elderly polite health center services have not been implemented in the Coronavirus disease (COVID-19) pandemic, (3) Feeling that they do not have a role in geriatric services in hospitals, (4) Hope that the network runs optimally as a pentahelix pilar, namely the government, academics, communities, business actors and the media, (5) Follow up interventions have not been optimal in health services for the elderly, (6) There is no integrated geriatric service.*
Conclusion: *Participants felt that the facilities and infrastructure were limited in elderly services. Overcoming these problems is needed among those in charge of the elderly and the head of the primary health center's leadership in regulating human resources in supporting elderly services.*

Keywords: *Advanced health facilities, elderly, primary health facility, service, sustainable*

RESUMEN

Introducción: *La continuidad de diversos servicios de salud, como hospitales y centros de salud, es necesaria para mantener la calidad de la atención a las personas mayores. Este estudio tuvo como objetivo explorar el papel de los proveedores de servicios en los servicios sostenibles para las personas mayores.*
Métodos: *Este estudio utilizó un método cualitativo para explorar los servicios sostenibles para las personas mayores. Los participantes de la investigación sumaron 16 personas, entre informantes primarios y secundarios. El investigador utiliza las pautas de discusión de grupo focal (FGD) para convertirse en su propio instrumento de investigación. El análisis en este estudio utilizó el Análisis Temático.*
Resultados: *Los resultados se obtuvieron a partir de 6 temas. Los temas consisten en: (1) Obstáculos en la evaluación de la salud de los ancianos, (2) Los*

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servicios de los centros de salud para ancianos no se han implementado en la pandemia de COVID-19, (3) Sentir que no tienen un papel en los servicios geriátricos en hospitales, (4) Esperanza de que la red funcione de manera óptima como un pilar de pentahélice, a saber, el gobierno, académicos, comunidades, actores empresariales y los medios de comunicación, (5) Las intervenciones de seguimiento no han sido óptimas en los servicios de salud para adultos mayores, (6) No existe un servicio geriátrico integrado.

Conclusión: *Los participantes sintieron que las instalaciones y la infraestructura eran limitadas en los servicios para ancianos. Es necesario superar estos problemas entre los encargados de las personas mayores y el liderazgo del jefe del centro de salud primario en la regulación de los recursos humanos en el apoyo a los servicios para personas mayores.*

Palabras clave: *Establecimientos avanzados de salud, adulto mayor, establecimiento primario de salud, servicio, sustentable.*

INTRODUCTION

One of the government plans based on implementing the Sustainable Development Goals (SDGs) in the health sector is to reduce the mortality rate from non-communicable diseases by prioritizing preventive and promotive efforts by taking a family approach (1,2). Optimizing continuous care (continuum of care) is a follow-up strategy to efforts to implement sustainable care. Continuous care is a form of care that is carried out from upstream to downstream, starting from the hospital to returning home. Continuous care is essential for patient safety, increasing staff and patient satisfaction, and reducing costs (3). Unsustainable maintenance impacts treatment quality, cost, and outcome (4). Many chronic diseases require long-term medical care because elderly patients generally suffer from various morbidities (5-7). High morbidity is also associated with treating the elderly in long-term care, which a nurse must understand in pharmacology (8,9). Health care centers as based on geriatric services, namely elderly health services organized by local health centers (10-13).

The continuity of various health services, such as hospitals and health centers, is needed to maintain the quality of care. One form of continuous care service currently running is for confirmed COVID-19 patients. A preliminary study conducted by researchers at one of the public health centers in Malang City found that the service flow for confirmed COVID-19 patients was clear and well-implemented. The service process starts from referral to the hospital until the patient is returned to the public health center and community, all carried out on an ongoing basis. The health center receives complete data on patients who have completed treatment at the hospital, both in terms of the patient's general condition and the treatment and therapy provided at the hospital. The comprehensive management plan established during the COVID-19 pandemic became the basis for sustainable services for the elderly (14).

Implementation of sustainable care is a challenge for all lines involved to provide accurate, time-efficient health services for the elderly with the realization of an elderly-friendly city (13,15). Therefore, it is essential to develop network support systems such as hospitals in implementing discharge planning services (8). In addition, providing information and knowledge support for primary care in sustainable care supports the efficiency and quality of nursing care (16). However, with the increasing need for community-based services, there are insufficient resources, including community health personnel, so the scheduling of nursing staff is not optimal, and service capacity cannot be fully utilized (17).

Health problems in Indonesia in the elderly are mostly hypertension (69.5 %), diabetes mellitus (8.9 %), stroke (60.2 %), and mental disorders (15.8 %) (National Risk Report, 2018). Although, until now, the level of independence of the elderly is still high, the dependence of the elderly in East Java continues to increase, causing high rates of long-term care. The level of independence of the elderly based on National Risk Report, in the community in East Java is 22 % light dependence. Malang City is one of the cities in East Java Province with several elderlies in 2021, as many as 145 917 with the elderly numbering 106 513 (72.9 %) and elderly at high risk 39 404 (27.1 %). Elderly with the most visits, namely 5 160 in 2020, with hypertension, diabetes mellitus, heart disease, and stroke. Based on the results of observations made by researchers, it was found a phenomenon in the community that the elderly group still did not use the services of the Public Health Center and

did not trust the officers when making further visits. Most of the elderly do not access health services because there is no medicine given. In addition, most areas of Malang City are urban areas where the main livelihood is as a retiree with a high level of education. This affects the level of dependence of the elderly on the hospital. This condition causes an increase in the number of older people undergoing rehospitalization, followed by an increase in elderly care.

Long-term geriatric care management in continuous care is grouped with health monitoring, health assessment, treatment planning, implementation, and evaluation activities (16,18). This requires integrated health services starting from the patient entering the hospital until leaving the hospital and returning to the home or community (14). In overcoming the health problems of the elderly, it is necessary to develop the elderly group through the public health center, which includes promotive, preventive, and rehabilitative activities (19). Post-discharge care for inpatients indicates that patients have post-discharge care recommended in an outpatient setting. Community health care system, i.e. primary care, including post-hospital visits, health surveillance, and drug monitoring (20). Continuous elderly care is still not implemented even though policies governing services are in place. Based on this description, the researcher wants to explore how the development of the concept of sustainable services for the elderly is currently running in the city of Malang.

METHODS

Research Design

This study used a qualitative grounded theory method to explore sustainable services for the elderly in Malang City, East Java Province, Indonesia. The research participants totaled 16 people, including primary informants and secondary informants. The main informants are representatives of various parties involved in elderly health services, about 11 participants, namely service providers in elderly health and health centers and hospitals. In addition, there are five secondary informants or service recipients, consisting of Non-Government organizations and health care volunteers. Inclusion criteria are as follows: 1) Engage in elderly health services; 2) Minimum 1-year experience in elderly health services; 3) Healthy psychologically and physically; 4) Have good communication skills and be willing to be a participant; 5) 18 years and over. In addition, the exclusion criteria in this study were informants who came out to implement the FGD before the implementation was completed.

Data Collection

The researcher becomes his research instrument using Focus Group Discussion guidelines in this qualitative research. This research was conducted in February-March 2022. After the verbatim transcript was carried out, the researcher analyzed the data by familiarising with the data in each participant's statement and coding it after getting the initial code, then grouped and organized it into themes and reviewed themes. Next, define and name the theme. This follows a series of processes carried out thoroughly and continuously on data, asking analytical questions, and writing short notes throughout the research.

Data Analysis

Thematic analysis was used for data analysis in this study. First, the researcher reread the results of the FGD recordings that had been done with the participants listening to the audio recording of the interview while reading the transcript to get as close as possible to the data and try to understand each sentence expressed by the participants. Then the researcher reread the results of the FGD recordings that had been carried out with the participants and listened to the audio recording of the interview while reading the transcript to get as close as possible to the data and try to understand each sentence expressed by the participants.

Ethical Approval

The research ethics was obtained from the Faculty of Medicine Ethics Committee from Universitas Brawijaya (No.51/EC/KEPK-S2/03/2022).

RESULTS

Table 1 describes the characteristics of the 16 participants, including age, gender, education, occupation, and the field they are engaged. Participants have an age range of 24 to 57 years. Thirteen participants were female, and three participants were male. Eight participants worked as Associate Degree in Nursing or ASN in the health sector, 2 participants worked as entrepreneurs, and four other participants worked as nurses in hospitals. Participants underwent various fields, namely person in charge of Elderly Health Service, Head of the Public Health Center, regional doctor, village head as well as elderly families and health cadres. The results obtained six themes below:

Table 1

Characteristics of Participants

Code	Age	Gender	Education	Occupation
P1	45	Female	Bachelor's degree	Public Employment
P2	24	Female	Bachelor's degree	Non-Public Employment
P3	39	Female	Master's degree	Public Employment
P4	48	Female	Bachelor's degree	Public Employment
P5	55	Male	Bachelor's degree	Public Employment
P6	27	Female	Bachelor's degree	Public Employment
P7	29	Female	Bachelor's degree	Public Employment
P8	39	Male	Master's degree	Public Employment
P9	54	Male	Bachelor's degree	Public Employment
P10	47	Female	Diploma degree	Non-Public Employment
P11	48	Female	Senior High School	Non-Public Employment
P12	45	Female	Senior High School	Housewife
P13	34	Female	Diploma degree	Nurse
P14	57	Female	Diploma degree	Nurse
P15	35	Female	Bachelor's degree	Nurse
P16	41	Female	Bachelor's degree	Nurse

Theme 1: Obstacles in the screening of elderly health

This statement is illustrated in the following quote:

"*The data collection is also real, and all get services... optimally following minimum service standards, so it's like that with the hope that its automatic achievements Malang city can be good, life expectancy also increases*" (P2).

"The indicators are a lot of weight, height and then blood pressure, blood sugar like that still has cholesterol, maybe the elderly person has his health checked, but it turns out that there is one of these indicators that is not fulfilled in the end, and it can't be entered" (P1).

"So at least the elderly are screened once a year, but indeed there are elderly who routinely check their health, such as going to clinics, hospitals or health centers that are recorded at the health office, which is once a year at least" (P2).

Theme 2: The elderly polite health center services have not been implemented in the COVID-19 pandemic

This statement is illustrated in the following quote:

"That's a polite elderly health center that we have evaluated yearly. There are several health centers that he started in 2020 when before COVID-19, he was still there prioritizing the

elderly; for example, there is an elderly poly, and there are still older people who are prioritized in the queue, but after COVID-19, some of the health centers This elderly poly has turned into a COVID-19 poly. Finally, there is no separate elderly poly. Maybe it can change the health services for the elderly during the COVID-19 period, and then the queue is like no, it doesn't take precedence like before there was COVID-19, anyway" (P2).

"Experiencing fear later, when you come to the public health centers, you will usually catch COVID-19" (P3).

Theme 3: Feeling that they do not have a role in geriatric services in hospitals

This statement is illustrated in the following quote:

"Hospitals that provide geriatric services are only available in the city of Malang, out of many hospitals, so there are only a few that can be counted with ten fingers, they can still be counted" (P2).

"Ever made coordination to be a hospital, the hospital has a geriatric poly, what is the initiative from the hospital itself, not because when we go down" (P1).

"because of this limitation, there is also limited manpower especially" (P2).

"The geriatric polyclinic seems to be more complex, not only providing a separate poly for the elderly but ... what are medical doctors and paramedics called" (P2).

Theme 4: Hope that the network runs optimally as a pentahelix pilar, namely the government, academics, communities, business actors, and the media

This statement is illustrated in the following quote:

"In terms of access to health services, in the end, there tends to be a decrease in visits" (P1).

"It has never been conveyed, so we hope that things like that can be networked, right?" (P1).

"We first built the network when, for example, we had a strong network, whether it was cross-sectoral with other cross-programs, whether it was with other OPD (Regional Apparatus Organizations) or maybe the role of government hospitals and private hospitals" (P1).

"To fulfill the SPM, we still need to procure strips and continue to fulfill height, blood pressure, and weight measuring devices at the Integrated Healthcare Center for the elderly. There are also elderly kits from the province from the Ministry of Health, but from outside the CSR (Corporate Social Responsibility) is still not available" (P1).

Theme 5: Follow-up interventions have not been optimal in health services for the elderly

This statement is illustrated in the following quote:

"It's only for strip books that we have a bit of trouble because these strips are only used once, and the number of new elderly people increases yearly" (P2).

"optimally following minimum service standards, so it is as expected" (P1).

"Screening is more of early detection. So what is the result of this screening? It turns out that this person is like this, who initially didn't realize that he had diabetes, he didn't realize that he had hypertension, so when he was screened earlier, it was found that he got health services earlier" (P3).

"Hopefully, the budget will follow, yes, the budget for the priority for the elderly can also get attention, maybe that's it" (P1).

Theme 6: There is no integrated geriatric service

This statement is illustrated in the following quote:

"The problem with geriatrics, what often is the risk of falling, is the risk of falling" (P13).

"Elderly people often forget, even though in education later, what was conveyed about the risk of falling has been educated, the family has

been reassured, the patient sometimes still falls, so that's why we convey it to the family" (P14).

"The markers on the bed and then in the bathroom also have handled" (P13).

DISCUSSION

The theme of requiring accuracy in recording and reporting affects the follow-up intervention that will be given. Inaccurate recording and reporting and data duplication from cadres and officers can use web recording and report (21). Manual recording and reporting are deficiencies with the patient's name, ID number, age, treatment, and daily activities and cannot be accessed by parties who need it (22). The service for the elderly polite health center during the COVID-19 pandemic has not run optimally. This is due to the limitation of direct and face-to-face contact. Participants felt that the public health centers were a place to transmit COVID-19 and feared they would be infected with COVID-19. This reduces visits to public health centers and causes uncontrolled health of the elderly.

Based on the results of previous studies, the lack of recording and completeness of reporting causes delays in reporting the elderly and can be accessed by all parties (21). This shows that recording and reporting are not well organized (21). Using a web information system makes it easier for officers to collect patient data and record examination results to minimize errors in recording and reporting and delays in data collection (22). Feeling that the service has not yet reached plenary in this study is a health service obtained by the elderly. Plenary service starts from simple laboratory examinations and a complete assessment of geriatric patients. The plenary assessment of geriatric patients consists of the level of independence, activities of daily living, risk of falling, geriatric depression scale, mini clog, and clock drawing test, mini-mental state examination, abbreviated mental test, and mini nutritional assessment. Elderly with a high level of independence, namely the level of dependence and risk of falls experienced by the elderly (23).

The factor of the elderly also determines the achievement of health screening. Not all older people who access health services go to integrated healthcare centers. This is because the elderly do not complain and feel that there are no perceived health problems (24). The service for the elderly polite health center has not yet been implemented in the COVID-19 pandemic. Participants' experiences during the COVID-19 pandemic, the elderly poly changed its function to the COVID-19 clinic. This also impacts the queue of elderly who follow the queue of general patients and decreases visits. Older people choose to access specialist health services or private practice doctors who put the elderly first, including in the queue. Following technical instructions, the elderly polite health center has a separate room and is easily accessible to the elderly (25).

The limited facilities and infrastructure in elderly services, namely from separate service places, doctors, and nurses. Limited human resources result in officers having concurrent duties or jobs, so the work done is not optimal. The limitations of tools and materials such as examination strips are not balanced, with the number of elderlies increasing yearly. This causes not all elderly to be screened. Refocusing the budget in 2021 due to the impact of the COVID-19 pandemic, where financing for the elderly program is diverted to overcoming COVID-19 (26).

Not all hospitals provide geriatric services. Participants felt that a small number of hospitals provide geriatric services. There are three elements of geriatric services, namely human resources, service flow, and infrastructure. The element of human resources is needed by officers who understand how to care for the recovery or maintenance of the elderly. The burden of the staff to care for can be two to three times caring for the elderly (27).

Cross-program and cross-sector linkages with advanced health facilities in tiered referrals have not been maximized. Referrals running, namely the elderly at risk in the integrated health centers, are referred to the health care center. Older people at risk need health education and information through health promotion personnel. Intensive counseling from health promotion opens further insight into being healthy, productive, and not a burden on the family. Health services with

comprehensive care in question are providing services by improving health (promotive), such as health education and preventive measures (preventive) (28).

Hope the network runs optimally as a pillar of the pentahelix. Participants felt that the network that had been established was not strong, both cross-sectoral and cross-program, and with related agencies. Participants find it difficult to doubt cooperation with other agencies or devices, not yet appropriately coordinated, only limited to Zakat House, a non-governmental organization (NGO), in chronic disease management. The middle and upper economic groups have more links to specialist doctors and independent practicing doctors or hospitals (29).

Follow-up interventions have not run optimally in health services for the elderly. Participants felt that they were still focused on the elderly screening, not yet on the follow-up of the results of the screening that had been obtained. Elderly health screening is the early detection of health. The elderly are unaware of their health conditions and do not feel any symptoms, such as hypertension or diabetes mellitus. The addition of the number of elderlies every year increases as well as the difficulty of the strip of examination, which is not balanced with the amount of elderly. On the other hand, services provided are more coordinated (30). Health services with comprehensive care in question are providing services by increasing body resistance and screening for disease risk, breaking the chain of disease transmission, and stopping the disease process as early as possible (28).

Some participants felt that the physiological changes in the elderly were a vulnerable group with physical limitations and comorbidities suffered by the elderly. Health services close to the elderly, such as integrated health centers in the nearest area. The monthly services impact the psychology of the elderly, namely being happy and feeling cared for by health workers. Participants felt the importance of accompanying after the patient came home from the hospital. However, participants found it difficult to control the control schedule for follow-up examinations. The non-home companion becomes an obstacle in monitoring the health of the elderly. Support from neighbors is needed in monitoring the health of the unaccompanied elderly. Monitoring related to drugs consumed by the elderly, control schedules to the hospital, referrals from the first health facilities and queue numbers at the hospital, as well as first aid in the event of an emergency before going to the hospital (31). The use of drugs requires a clear explanation and education, especially in the use of tablet drugs such as Symbicort and the use of insulin (32).

CONCLUSION

Participants felt that they had not yet received excellent service. Experienced difficulties in screening elderly health. This is because the service for the elderly polite health center was not implemented during the COVID-19 pandemic. Participants felt that the facilities and infrastructure were limited in elderly services, plus there were not enough hospitals that provided geriatric services. Overcoming these problems is needed among those in charge of the elderly, as well as the ability of the head of the public health centers as a leader in regulating human resources in supporting elderly services and support from networks that run optimally as the pillars of the pentahelix.

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Correlation of self-efficacy and self-management among patients undergoing hemodialysis with intradialytic hypertension complications

Correlación de autoeficacia y automanejo entre pacientes en hemodiálisis con complicaciones hipertensivas intradiálisis

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SUMMARY

Introduction: *Intradialytic hypertension (IDH) is a phenomenon in which blood pressure increases during hemodialysis. Increased awareness and thorough understanding of the complications associated with intradialytic are needed in managing the disease independently. In addition, self-efficacy can support self-management behaviour. This study aimed to analyze the relationship between self-efficacy and self-management of hemodialysis patients who had complications of intradialytic hypertension.*
Methods: *This research uses an analytical survey method with a cross-sectional approach. The sample uses purposive sampling with a sample of 40 hemodialysis patients who had complications of intradialytic hypertension. The data collection tools included the patient's demographic characteristics, a self-management questionnaire, and a self-efficacy questionnaire. Data were analyzed using Spearman Rank with a 95 % confidence level.*
Results: *The characteristics of the respondents in this study were balanced between men and women, aged between 40-59 years, with high school education level, the majority work, and hemodialysis (HD) duration > 12 months. The results showed that there was a significant relationship between self-efficacy and self-management of hemodialysis patients who had complications of intradialytic hypertension (p-value=0,04).*
Conclusion: *There is a weak and positive relationship between self-efficacy and self-management in hemodialysis patients with complications of intradialytic hypertension. Based on the results, it is recommended to conduct research with bigger sample size and represent various settings.*

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RESUMEN

Introducción: *La hipertensión intradiálisis (HID) es un fenómeno en el cual la presión arterial aumenta durante la hemodiálisis. Se necesita una mayor conciencia y una comprensión profunda de las complicaciones asociadas con la intradiálisis para manejar la enfermedad de forma independiente. Además, la autoeficacia puede apoyar el comportamiento de autogestión. Este estudio tuvo como objetivo analizar*

la relación entre la autoeficacia y el automanejo de pacientes en hemodiálisis que presentaron complicaciones de la hipertensión intradiálisis.
Métodos: *Esta investigación utiliza un método de encuesta analítica con un enfoque transversal. La muestra utiliza un muestreo intencional con una muestra de 40 pacientes en hemodiálisis que presentaron complicaciones de la hipertensión intradiálisis. Las herramientas de recolección de datos incluyeron las características demográficas del paciente, un cuestionario de automanejo y un cuestionario de autoeficacia. Los datos se analizaron utilizando Spearman Rank con un nivel de confianza del 95 %.*
Resultados: *Las características de los encuestados en este estudio fueron equilibradas entre hombres y mujeres, con edad entre 40-59 años, nivel educativo medio, mayoría trabajadores y duración de hemodiálisis (HD) > 12 meses. Los resultados mostraron que hubo una relación significativa entre la autoeficacia y el automanejo de los pacientes en hemodiálisis que presentaron complicaciones de la hipertensión intradiálisis (p-valor=0,04).*
Conclusión: *Existe una relación débil y positiva entre la autoeficacia y el automanejo en pacientes en hemodiálisis con complicaciones de la hipertensión intradiálisis. Con base en los resultados del estudio, se recomienda realizar una investigación con un tamaño de muestra más grande y que represente varios entornos.*

Palabras clave: *Hemodiálisis, hipertensión intradiálisis, autoeficacia, automanejo*

INTRODUCTION

Chronic kidney disease (CKD) is a significant disease and often appears as a major public health problem that raises a patient's risk of developing several life-threatening medical conditions (1). The common treatment of advanced CKD is hemodialysis (2-4). Hemodialysis is one of the safest renal replacement therapies in patients with terminal renal failure, and the wide accessibility of this therapy has extended the patient's life. However, this therapy also causes several complications during dialysis, including hypertension, hypotension, muscle cramps, nausea, and vomiting (1,5-8).

Intradialytic hypertension occurs in 5-20 % of hemodialysis procedures (9). According to a study conducted by Buren in a retrospective cohort study, the prevalence of intradialytic hypertension was 21.3 per 100 dialysis procedures (10). Several studies in Indonesia show that the incidence of intradialytic hypertension is a complication that often occurs in some patients. For example, research in Denpasar showed that the incidence of IDH was 32.1 % (11). According to data from the Indonesian Renal Registry, the most common hemodialysis complication is intradialytic hypertension 38 % (12).

Intradialytic hypertension is a persistent increase in blood pressure during hemodialysis, and blood pressure during and at the end is higher than blood pressure at the beginning of hemodialysis (13-16). The other study explained that the causes of increased intradialytic blood pressure (hypertension) were excess fluid volume, increased cardiac output, overactivity of the sympathetic nervous system, stimulation of the Renin-Angiotensin system (RAS), electrolyte changes in the dialysis process, endothelial dysfunction, erythropoietin therapy, and antihypertensive drugs during the dialysis process (13,17).

Hemodialysis patients with complications of intradialytic hypertension need to manage self-management better to improve their health. The habit of self-management plays an important role in managing chronic disease, coping management, and managing conditions caused by chronic disease by modifying lifestyle. If someone performs self-management effectively, it will increase patient satisfaction in living life. Lowering the cost of care, increasing the patient's self-confidence and independence, and improving the patient's quality of life (18-20). Good self-management also has an important role in effectively controlling blood pressure in hypertensive patients (21). Self-management is a person's ability to manage the symptoms and consequences of chronic diseases such as medication and treatment, physical activity, social activities, and lifestyle changes (22).

Self-efficacy is the basis of self-management, which will affect the confidence of hypertensive patients to make changes or adjustments in behaviour to achieve hypertension treatment goals (23). Self-efficacy is a person's belief in carrying out certain activities, including the belief to carry out activities when there are obstacles to achieving certain goals (24). Self-efficacy effectively increases hemodialysis patients'

adherence to the treatment they are undergoing. In addition, high self-efficacy will impact patients and increase the level of healing and self-confidence to improve a person's quality of life (25).

Many studies have been conducted to increase the self-efficacy of patients undergoing hemodialysis therapy. Still, no study has assessed the relationship of self-efficacy to self-management of hemodialysis patients who have complications of intradialytic hypertension. Therefore, this study aimed to analyze the relationship between self-efficacy and self-management of hemodialysis patients who experience complications of intradialytic hypertension.

METHODS

Study Design and Respondent Selection

This research is a quantitative study with a cross-sectional approach. The population of this study was all hemodialysis patients who were at one of the hospitals in East Java, Indonesia, with a total of 65 patients. This study took samples by purposive sampling, where all patients who met the inclusion and exclusion criteria were used as research samples, with a sample of 40 people. The inclusion criteria were patients who underwent minimal hemodialysis therapy once a week. In addition, the patient has a history and complications of hypertension, the patient is cooperative and can communicate well and can read and write, is aged 24-65 years, and is willing to be a respondent and sign an informed concert. Meanwhile, the exclusion criteria were that the patient had complications (diabetes mellitus, heart disease, stroke, or other terminal illnesses), the patient had trouble communicating, and was dependent on daily activities. Researchers conducted observations and filled out questionnaires directly to research respondents to collect data when patients are undergoing hemodialysis.

Instruments

This study consisted of 3 questionnaires. The first is the demographic characteristics of the patient. This section contains general information (such as age, gender, education level, occupation, and duration of hemodialysis). The second is a self-management questionnaire for hemodialysis patients, which consists of self-management at home and during hemodialysis with a total of 29 question items (26). This questionnaire is valid and reliable, with a Cronbach's Alpha value of 0.809. The self-management questionnaire to measure the self-management ability of hemodialysis patients includes two types of questionnaires: a self-management questionnaire for hemodialysis patients at home and a self-management questionnaire for hemodialysis patients during dialysis. In the self-management questionnaire for hemodialysis patients at home, there are 20 question items, namely numbers 1 - 20. Types of self-management questionnaires for hemodialysis patients during dialysis have 9 question items, namely numbers 21 - 29. The total number of questionnaire questions is 29 pieces, and each has four answer choices with a score of 1 to 4.

The third is a self-efficacy questionnaire consisting of 25 question items (27). Self-efficacy questionnaire to measure the self-efficacy ability of hemodialysis patients, covering four domains: autonomy, self-integration, problem-solving, and seeking social support. In the autonomy domain, there are 8 question items, namely questions number 1 - 8. The self-integration domain has 7 question items, namely numbers 9 - 15. The problem-solving domain has 6 question items, namely questions number 16 - 21. The domain for seeking social support has 4 question items, namely questions number 22 - 25. The total number of questionnaire questions is 25, and each has four answer options with a score of 1 to 4. The validity test on the self-efficacy questionnaire with a total of 25 questions is declared entirely "valid" with a Pearson correlation value > 0 .5 (0.59 - 0.91).

Ethical Considerations

The Sekolah Tinggi Ilmu Kesehatan Pemerintah Kabupaten Jombang No. 0522060004/KEPK/STIKES-PEMKAB/JBG/VI/2022 has granted an ethical license for this study. In addition, the hospital administration has also

permitted the collection of the data. Prospective respondents get an explanation regarding the aims and objectives of this research. Respondents were informed that their participation in the study was voluntary, and they could withdraw from the study at any time, and it would not affect their subsequent treatment. The results of respondents' answers are also guaranteed privacy and confidentiality. Before collecting data, respondents must sign an informed concert sheet first.

Statistical Analysis for Data

Data has been recorded, classified, tabulated, and processed using a personal computer and analyzed using IBM SPSS software version 23.0. Univariate analysis was conducted to determine the frequency and percentage distribution of respondents' characteristics, self-management, and blood pressure before dialysis. This data is presented in numbers and percentages. The results are said to be significant with a p-value<0.05. Analysis of bivariate test using Pearson Correlation.

RESULTS

A total of 40 patients met the inclusion criteria. The demographic characteristics of the participants are described in Table 1. The characteristics of respondents who experienced complications of intradialytic hypertension in this study were categorized: gender, age, education level, occupation status, and time using dialysis therapy. Half of this study's participants were males (50 %). Most patients were 41-60 years (55 %). The highest education level was high school (42.5 %). Most of the patients were currently working (55 %). In addition, 77.5 % reported having been on dialysis for > 12 months.

Table 2 showed the mean total self-efficacy score was 83.60±12.09. Table 2 shows the mean score for each subscale: autonomy (29.28±4.35), self-integration (19.45±4.81), problem-solving (17.88±4.26), and seeking social support (14.80±2.29). In addition, the mean self-management score was 79.78±8.79. The mean score for each subscale: self-management at home (50.15 ± 4.57) and self-management during HD (26.83±4.99).

Table 3 shows the correlation between self-efficacy and self-management scores by using Pearson's correlation. There was a moderate positive correlation between self-efficacy and self-management (r=0.322, p<0.05). Besides that, the correlation for each subscale of self-efficacy: autonomy (r=0.049, p>0.05), self-integration

Table 1

Characteristics of the study population (n=40)

Variable	N	%
Gender		
Man	20	50
Woman	20	50
Age (year)		
18-40	7	17.5
41-60	22	55
>60	11	27.5
Education Level		
No school	2	5.0
Elementary school	7	17.5
Junior high school	13	32.5
Senior high school	17	42.5
College	1	2.5
Occupational status		
Unemployed	18	45
Employee	22	55
Time using dialysis therapy		
0-12 months	9	22.5
>12 months	31	77.5

Table 2

Descriptive statistics of self-efficacy and self-management, n=40

Subscale	Mean (SD)	Median	Min-Max	95 % CI
Autonomy	29.28(4.35)	31	17-32	27.88-30.67
Self-integration	19.45(4.81)	19.50	10-28	17.91-20.99
Problem-solving	17.88(4.26)	20	8-23	16.51-19.24
Seeking social support	14.80(2.29)	16	9-16	14.07-15.53
Total score for Self-efficacy	83.60(12.09)	89	52-97	79.73-87.47
Self-management at home	50.15(4.57)	52.50	41-57	48.69-51.61
Self-management during HD	26.83(4.99)	28	17-34	25.23-28.42
Total score for self-management	79.78(7.89)	81.50	60-91	77.25-82.30

Table 3

Correlation between self-efficacy and self-management

Variable (subscale)	Self-management score	p-value
Autonomy	0.049	0.76
Self-integration	0.399	0.01*
Problem-solving	0.143	0.38
Seeking social support	0.201	0.21
The total score of Self-efficacy	0.322	0.04*

Correlation is significant at P value < 0.05
*p-value<0.05

(r=0.399, p<0.05), problem-solving (r=0.143, p> 0.05), and seeking social support (r=0.201, p>0.05).

DISCUSSION

Respondents who underwent HD with complications of intradialytic hypertension were mostly middle-aged, between 41 and 60. Age factors can affect the increase in blood pressure (hypertension) during intradialytic. The majority of several studies explain that age and gender affect increasing intradialytic blood pressure. According to research conducted by Inrig (2010) that most hemodialysis patients who experience intradialytic hypertension are >60 years old (28). This is supported by the research of Dubin et al. (2011) that increasing age is associated with an increase in the prevalence of intradialytic hypertension (p=0.03) (29). However, there is research conducted by Lolyta and Solechan (2012) that age has no significant effect on intradialytic hypertension (p>0.05) (30). According to a study by Inrig et al. in 32 295 patients, the incidence of IDH was higher at a late age. Nilrohit et al. (2017) also found that IDH was more common at a late age but was not statistically significant (31). The majority of respondents with high school education levels. This is associated with high socioeconomic conditions, resulting in the food consumed by the patient containing a lot of high fat, high cholesterol, smoking habits, and drinking alcohol are risk factors for causing metabolic diseases such as hypertension and diabetes. More than half of patients with HID are also working. This can be related to stress at work, so it can increase a person's blood pressure when the patient experiences HID. Most respondents underwent HD for 12 months (77.5 %) which had complications of intradialytic hypertension.

Based on the results of this study, it is known that the average self-efficacy score is 83.60 (12.09). This shows that the mean self-efficacy score of respondents who experienced intradialytic hypertension was adequate. This study's results align with the research conducted by Lenggogeni et al. (2021). They explained that the self-efficacy of chronic kidney failure patients undergoing hemodialysis was moderate self-efficacy, with a mean of 72.25 (9.73) (27). Therefore, self-efficacy is very important for HD patients with complications of intradialytic hypertension. Self-efficacy is a form of individual belief in himself in acting (32). Self-efficacy is needed in HD patients to be able to do good self-management. When someone has low self-efficacy, self-management will be hampered.

On the other hand, when self-efficacy is good, self-management will also be smooth (4). This high mean score results can be due to several factors, namely self-motivation and HD duration. The patient's self-motivation is high toward healing the illness. Although some patients are sure and understand that the disease will not be cured, the patient also assumes that at least the disease does not occur further complications. The longer the patient undergoes hemodialysis therapy, the better and more obedient the patient will be because the patient gets health education or information about complications.

The results showed that the highest efficacy sub-variable was autonomy, which was 29.28 (4.35). This study's results align with other studies, where the highest efficacy sub-variable is autonomy (4,27). HD patients with IDH complications will be more alert than other HD patients. Patients must be able to overcome the limitations caused by HD so that HD patients have high autonomy to overcome the limitations caused by dialysis. This condition will cause the patient to ask questions and seek information from health workers (doctors and nurses) about the disease and the actions that must be taken. In addition, patients also experience changes in their daily lives, and patients cannot do ADL and

worry about work, marital status, and others. This change causes patients to be interested in knowing all about hemodialysis.

Self-management of hemodialysis patients with complications of intradialytic hypertension has a higher mean of 79.78 (7.89). This is to research conducted by Purba et al. (2018) that the patient's self-management showed a good category (33). In this study, self-management in HD patients with complications of IDH can be caused because patients often get information from health workers about their conditions and how to overcome them. This knowledge is considered to foster self-confidence, self-efficacy, and patient compliance, especially in making decisions to carry out self-management. Most of the patients had HD for 12 months. Therefore, in the first six months of undergoing HD, patients will gain knowledge that can improve the implementation of self-care management.

Self-management is the ability of individuals, families, or communities to promote health, prevent disease, maintain health and cope with illness and disability with or without support from health professionals. Self-management in hemodialysis patients with complications of intradialytic hypertension is a positive effort for patients to participate in their health care to optimize health, prevent complications, control signs and symptoms, follow treatment, and minimize the effects of the disease in their lives. Self-management that hemodialysis patients must carry out includes fistula treatment, activity, diet, and monitoring of body weight and blood pressure. In addition, hemodialysis patients should reduce fluid intake to control body weight and blood pressure. In addition, hemodialysis patients must adhere to hemodialysis and take drugs (34).

This study's results indicate a positive and significant correlation between self-efficacy and self-management in HD patients with complications of intradialytic hypertension. This is in line with research conducted by Li et al. (2014), who also showed that self-efficacy positively correlates with self-management in patients undergoing hemodialysis (35). The results showed that low self-efficacy was associated with non-adherence in patients undergoing hemodialysis treatment. In other words, someone with high self-efficacy will have good self-management and vice versa. Self-efficacy is important for successful self-management in hemodialysis patients (36). Increased self-efficacy can improve self-management. Self-efficacy is a strategy to improve self-management behaviour, especially for vulnerable and diverse populations. Self-efficacy will provide a form of description of the behaviour carried out related to self-management. Self-efficacy was also noted as a suitable component for improving self-management for various chronic conditions.

CONCLUSION

Most of the respondents have good self-efficacy and self-management. Self-efficacy has a weak and positive relationship with self-management of hemodialysis patients with complications of intradialytic hypertension. There is a significant relationship between self-efficacy and self-management among hemodialysis patients with intradialytic hypertension complications. Based on the research findings, researchers suggest that services are improved must make a health program related to hemodialysis regularly every month, especially to increase the self-efficacy of hemodialysis patients who experience intradialytic hypertension, such as sharing from experts about how to maintain their health and telling personal experiences of someone with the same complication. The clinical implication of this study is that special medical attention should be given to older and newly diagnosed End-Stage Renal Disease (ESRD) patients with low levels of education. This is expected to increase self-efficacy so that patient self-management will also increase.

CONFLICTS OF INTEREST

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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The effect of maternal role identity application on cognitive development in stunting children aged 1-3 years in a public health center

El efecto de la aplicación de la identidad del rol materno en el desarrollo cognitivo en niños con retraso del crecimiento de 1 a 3 años en un centro de salud pública

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SUMMARY

Introduction: *Disorders of cognitive development in children aged 1-3 years are generally caused by stunting conditions and the role of mother care that is less than optimal. This study aimed to determine the effect of maternal role identity on cognitive development in children aged 1-3 years in the public health center.*
Methods: *The research design used a quasi-experiment with two groups pretest-posttest design. A simple random sampling technique was used to select 60 mothers with children aged 1-3 years with cognitive developmental disorders. The instrument is an observation sheet on applying maternal role identity according to the intention-based maternal role attainment module and a capture scale assessment sheet. Data analysis was undertaken by using paired samples t-test and independent samples t-test.*
Results: *The results showed that most mothers had stunted children aged 12-24 months (46.7 %) and males (66.7 %). Applying maternal role identity according to the intention-based maternal role attainment module effectively increased cognitive development in stunting and normal children aged 1-3 years (p-value = 0.0001).*
Conclusion: *It is highly recommended that the intervention for applying for the mother's role according to the intention-based maternal role attainment module be implemented to increase the role of the mother's care in nurturing and stimulating children's cognitive development. Therefore, Public health center cadres need to provide counseling related to the application of the intention-based maternal role attainment module.*

Keywords: *Cognitive development, learning module, maternal role attainment, stunting, toddler children.*

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RESUMEN

Introducción: *Los trastornos del desarrollo cognitivo en niños de 1 a 3 años generalmente son causados por condiciones de retraso del crecimiento y el papel del cuidado de la madre que es menos que óptimo. Este estudio tuvo como objetivo determinar el efecto de la identidad del papel materno sobre el desarrollo cognitivo en niños de 1 a 3 años en el centro de salud pública.*

Métodos: *El diseño de la investigación utilizó un diseño de cuasi-experimental con dos grupos pretest-postest. Se utilizó una técnica de muestreo aleatorio simple para seleccionar 60 madres con niños de 1 a 3 años con trastornos del desarrollo cognitivo. El instrumento es una hoja de observación sobre la aplicación de la identidad del papel materno según el módulo de logro del rol materno basado en la intención y una hoja de evaluación de la escala capute. El análisis de datos se llevó a cabo utilizando la prueba t de muestras pareadas y la prueba t de muestras independientes.*
Resultados: *Los resultados mostraron que la mayoría de las madres tenían niños con retraso del crecimiento de 12 a 24 meses (47,6 %) y del sexo masculino (66,7 %). La aplicación de la identidad del papel materno de acuerdo con el módulo de logro del papel materno basado en la intención aumentó efectivamente el desarrollo cognitivo en niños normales y con retraso del crecimiento de 1 a 3 años (valor p = 0,0001).*
Conclusión: *Se recomienda encarecidamente que se implemente la intervención para solicitar el papel de la madre según el módulo de logro del papel materno basado en la intención para aumentar el papel del cuidado de la madre en la crianza y estimulación del desarrollo cognitivo de los niños. Por lo tanto, los cuadros de los centros de salud pública deben brindar asesoramiento relacionado con la aplicación del módulo de logro del rol materno basado en la intención.*

Palabras clave: *Desarrollo cognitivo, módulo de aprendizaje, logro del rol materno, retraso en el crecimiento, niños pequeños.*

INTRODUCTION

Becoming a mother is a valuable yet challenging experience as a new role and responsibility in women's life. Becoming a mother requires knowledge, skills, and the ability to adjust to physical, psychological, and social status (1,2). The achievement of the mother's role is a process where a mother can reach her ability in carrying out her role as a mother and integrate her motherly attitude until they get a new role where they gain self-confidence and harmony with their new identity (3). Maternal identity is formed four months after giving birth. In the first year after the birth of a child, 4 % of mothers fail to establish a maternal identity as maternal identity peaks four months after birth. Mothers said they felt less competent and their observed maternal competence decreased significantly at 8 and 12 months (4). On the other hand, children need appropriate parenting roles for optimal development. Likewise, stunting children who experience cognitive developmental disorders need the right parenting role. Poor role of mothers who unmet the basic needs of children certainly have a negative impact on children. If the mother's role is unsuccessful, the child will experience growth and development disorders. Moreover, it will be difficult to detect whether the child has a growth delay (5).

Based on the United Nations International Children's Emergency Fund (UNICEF), globally, about 1 of 4 children under five experience stunting, and the prevalence of stunting is 171 million children, of which 167 million occur in developing countries (6). In 2017, the number of children under five who experienced stunting was around 22.2 %, or 150.8 million children under five. Stunting affects about a quarter to half of the children in developing countries due to poverty, malnutrition, and infectious diseases. In Indonesia, based on Indonesian basic health research in 2013 (7), 37.2 % of children under five are stunted. From the results of these percentages, 19.2 % of children are short, and 18.0 % are very short. Stunting prevalence has increased compared to the 2010 results of 35.6 % (7). Based on research results (8), the prevalence of stunting is 35.8 %, while in the Surabaya City area, the prevalence of stunting in children is 21.5 % (9). Based on data from the Surabaya Health Office in 2019 in the Kenjeran Health Center Surabaya area, the prevalence of stunting in children was 21.78 % (10). In a preliminary study conducted at one of the public health centers in Surabaya, Indonesia, there were 610 stunting toddlers or 21.78 % in 2019.

Direct and indirect factors can cause stunting. The direct causes are lack of food intake and infectious diseases in toddlers (11-13), while the indirect cause is one of mothers' knowledge and poor parenting. The low knowledge of mothers about stunting causes the parenting pattern of giving food to the family to be not good (14). Parents, especially mothers, play a role in raising children and providing education to children so that children's development is optimal. Children who get less attention to their parents' diet will experience impaired growth and cognitive development caused by nutritional disorders (15,16). Inappropriate parenting roles have an impact on children's

cognitive development or intelligence. Cognitive development is related to physical development, namely in the development of the brain and nervous capacity. It is also related to language, emotion, and moral development (17). The nervous system's performance in stunted children often decreases, which has implications for the child's low intelligence (18). The bad impact that nutritional problems in the short term can cause is disruption of brain development, intelligence, impaired physical growth, and metabolic disorders in the body. While in the long term, the bad consequences that can be caused are a decrease in cognitive abilities and learning achievement (19).

Nurses act as educators, nursing care providers, and collaborators. As educators, they provide health education to mothers in applying maternal role identity to raise children for optimal child development. Nurses as nursing care providers develop nursing care processes (routine weighing, measuring, and monitoring child development), while as collaborators, they collaborate with nutritionists to provide additional food for pregnant women, fulfilling nutrition for children so that it is expected to minimize stunting incidents. This means providing food of good quality and quantity to support growth and development so that children can grow normally and healthy, and free from disease (20). Mothers' knowledge and care about nutritional needs, feeding methods, and child feeding schedules play an essential role in determining the nutritional status of children. One of the efforts that can be made is to meet children's basic needs. In applying maternal role identity in overcoming cognitive developmental disorders in stunted and normal children, it is necessary to achieve the mother's role and develop correct and appropriate maternal behaviour (21). Based on these data, this research studies the effect of maternal role identity application on cognitive development in stunting children aged 1-3 years in the public health center.

METHODS

This study used an experimental research design with a quasi-experimental type of research. The two-group pretest-posttest design method was used to reveal a causal relationship by involving the control group in addition to the experimental group. The sampling technique in this study was probability sampling with a simple random sampling approach with a total of 60 respondents divided into stunting and normal children. This study involved mothers with children with cognitive developmental disorders. The instrument in this study used an observation sheet on the mother's parenting role according to the intention-based maternal role attainment learning module and the capture scales assessment sheet. The analytical test used was the Paired Samples T-test and the Independent Samples T-test. This study obtained ethical clearance from Sekolah Tinggi Ilmu Kesehatan hang Tuah Surabaya with the number PE/17/VI/2021/KEPK/SHT.

RESULTS

Table 1 showed the results of the characteristics of respondents in mothers with stunting children in the treatment group, and more children were aged 12-24 months (46.7 %), male (66.7 %), 2nd child (60 %), and immunization status complete (86.7 %). As many as 40 % of mothers were aged 20-29 years with senior school education (40 %) and not working or housewives (73.3 %). While the characteristics of fathers with stunting children, 60 % had a high school education and worked as laborers (53.3 %) with an IDR 2,000,000-4,000,000 per month (40 %). While in the normal treatment group, most of the children were aged 25-36 months (73.3 %), male (66.7 %), second child (80 %), and complete immunization status (93.3 %).

Table 2 showed that the cognitive development of stunted children before maternal role attainment intervention was 100 % experiencing cognitive development disorders with an overall average score of 82.81. However, after being given an intention-based maternal role attainment intervention, the average value of cognitive development increased to 89.06, with 9 (60 %) normal and 6 (40 %) suspected of experiencing cognitive development disorders. The paired samples t-test showed that p-value = 0.0001, which means there was an influence before and after the application of maternal role identity

according to the intention-based maternal role attainment module on cognitive development in stunted children aged 1-3 years. In the same way, if an intention-based maternal role attainment intervention was given to normal children, the average value of cognitive development increased to 89.26. This showed an influence before and after applying the maternal role identity according to the intention-based maternal role attainment module on cognitive development in normal children aged 1-3 years (p-value<0.0001). However, the test result used an independent sample t-test showed a difference in the effect after applying maternal role identity according to the intention-based maternal role attainment module on cognitive development in stunting and normal children aged 1-3 years (p-value = 0.0001).

Table 1

Respondents Characteristic

Respondents Characteristic	Stunting Children				Normal Children			
	Treatment		Control		Treatment		Control	
	n	%	n	%	n	%	n	%
Child Age								
<12 Months	0	0	0	0	0	0	0	0
12-24 Months	7	46.7	2	13.3	1	6.7	0	0
25-36 Months	6	40.0	6	40.0	11	73.3	15	100.0
>37 Months	2	13.3	7	46.7	3	20.0	0	0
Child Sex								
Male	10	66.7	5	33.3	10	66.7	5	33.3
Female	5	33.3	10	66.7	5	33.3	10	66.7
Child Order								
First Child	3	20.0	1	6.7	0	0	0	0
Second Child	9	60.0	14	93.3	12	80.0	15	100.0
Third Child	3	20.0	0	0	3	20.0	0	0
Number of Children in a family								
Only Child	3	20.0	1	6.7	0	0	0	0
2 siblings	9	60.0	14	93.3	12	80.0	15	100.0
3 siblings	3	20.0	0	0	3	20.0	0	0
Immunization Status								
Complete	13	86.7	15	100.0	14	93.3	15	100.0
Incomplete	2	13.3	0	0	1	6.7	0	0
Mother's Age								
<20 years	1	6.7	0	0	1	6.7	0	0
20-29 years	6	40.0	6	40.0	6	40.0	6	40.0
30-39 years	4	26.7	6	40.0	5	33.3	6	40.0
40-49 years	4	26.7	3	20.0	3	20.0	3	20.0
Mother's Last Educational Status								
Elementary School	3	20.0	2	13.3	2	13.3	2	13.3
Junior High School	3	20.0	4	26.7	2	13.3	4	26.7
Senior High School	6	40.0	9	60.0	8	53.3	9	60.0
Higher Education	3	20.0	0	0	3	20.0	0	0
Mother's Occupation								
Housewives	11	73.3	10	66.7	10	66.7	10	66.7
Private	2	13.3	3	20.0	2	13.3	3	20.0
Labor	2	13.3	2	13.3	3	20.0	2	13.3
Mother's Income (IDR per Month)								
Unemployed	11	73.3	10	66.7	11	73.3	10	66.7
< 2,000,000	2	13.3	2	13.3	3	20.0	2	13.3
2,000,000-4,000,000	0	0	2	13.3	0	0	2	13.3
4,000,000	2	13.3	1	6.7	1	6.7	1	6.7

Continued on page S917…

…continuation Table 1.

Respondents Characteristic	Stunting Children				Normal Children			
	Treatment		Control		Treatment		Control	
	n	%	n	%	n	%	n	%
Father's Age								
20-29 years	5	33.3	5	33.3	4	26.7	5	33.3
30-39 years	5	33.3	5	33.3	6	40.0	5	33.3
40-49 years	5	33.3	5	33.3	5	33.3	5	33.3
Father's Last Educational Status								
Elementary School	0	0	1	6.7	0	0	1	6.7
Junior High Scool	2	13.3	1	6.7	2	13.3	1	6.7
Senior High School	9	60.0	13	86.7	9	60.0	13	86.7
Higher Education	4	26.7	0	0	4	26.7	0	0
Father's Occupation								
Private	6	40.0	7	46.7	7	46.7	7	46.7
Public	1	6.7	0	0	1	6.7	0	0
Labour	8	53.3	7	46.7	7	46.7	7	46.7
Farmer	0	0	1	6.7	0	0	1	6.7
Father's Income (IDR per Month)								
<2,000,000	4	26.7	8	53.3	5	33.3	8	53.3
2,000,000-4,000,000	6	40.0	6	40.0	4	26.7	6	40.0
>4,000,000	5	33.3	1	6.7	6	40.0	1	6.7
Type of the Family								
Nuclear Family	11	73.3	14	93.3	11	73.3	14	93.3
Extended Family	4	26.7	1	6.7	4	26.7	1	6.7
Single Parents Family	0	0	0	0	0	0	0	0
Total	15	100.0	15	100.0	15	100.0	15	100.0

Table 2

The Effect of Applying Maternal Role Identity on Cognitive Development in Stunted and Normal Children Aged 1-3 Years

Group	Cognitive Development						Median (Min-Max)	Median p-value	p-value
	Normal		Suspect		Mental Retardation				
	n	%	n	%	n	%			
Stunting Children (Treatment)									0.0001**
Pre Test	0	0	15	100	0	0	82.81 (79.83-84.31)	0.0001*	
Post Test	9	60	6	40	0	0	89.06 (80.25-97.34)		
Stunting Children (Control)									
Pre Test	0	0	15	100	0	0	83.52 (82.00-84.84)	0.107	
Post Test	0	0	15	100	0	0	83.71 (82.50-84.84)		
Normal Children (Treatment)									0,0001**
Pre Test	0	0	15	100	0	0	82.95 (81.67-83.94)	0,0001*	
Post Test	11	73.4	4	26.4	0	0	89.26 (83.46-97.70)		
Normal Children (Control)									
Pre Test	0	0	15	100	0	0	83.52 (81.29-84.86)	0,085	
Post Test	0	0	15	100	0	0	83.98 (82.29-84.86)		

*Paired t-test **Independent sample t-test

DISCUSSION

The results showed that cognitive development in stunted children mostly occurred at 12-24 months. This was in line with previous research, which stated that the condition of children who experienced stunting at the age of 0-2 years could interfere with children's cognitive, language, and motoric development (22). The results of theory and research (23) explained that each organ (physically and psychologically) was claimed to be mature when it reached its ability to carry out its respective roles. This was related to the chronological age of the child. This was in line with Santrock's research (24). Cognition refers to mental activities about how information enters the mind, is stored and transformed, and is recalled and used in complex activities such as thinking (25).

There is a difference in the effect of applying maternal role identity according to the intention-based maternal role attainment module on cognitive development in stunted children aged 1-3 years at the public health centre. The results of this study were supported by Santrock (26,27) that cognitive development coexisted with the process of genetic growth or physical maturity of children. Stunting in early childhood could cause permanent damage to cognitive development, followed by less than optimal motor and intellectual development (28). Thus, it can have an impact on education. This was based on the theory of Chang et al., in 2010 who indicated that stunting was related to cognitive development as seen in the ability to count, spell, read words and read thoroughly (29) and the relationship between fine motor abilities and school achievement and intelligence. Method: A cohort of stunted children who had participated in a randomized trial of psychosocial stimulation and/or nutritional supplementation in early childhood was compared with a group of non-stunted children. Fine motor abilities were assessed in 116 stunted (67 males, 49 females. Hence, stunted children achieve lower education compared to normal children. The results of this study were supported by research by Ijarotimi and Ijadunola in Nigeria (30), which found that children with poor nutrition will experience changes in metabolism that impact cognitive abilities and brain abilities. This was because the cortex in children was malnourished, and a lack of protein energy will affect the function of the hippocampus and brain in forming and storing memories (14).

The parenting role of mothers has an essential impact on children's cognitive and social development (31). This was in line with Mercer's (2004) research which suggested that it took a long time for a new mother to understand the role of the mother. Through daily interactions with infants in microsystem components, mothers practice infant care practices and understand how infants react to themselves and others (32). Parents, especially mothers, play a role in raising children and providing education to children so that children's development is optimal. This is evidenced by Widiantoro et al. in 2013, who concluded that parents who give a stimulus could positively impact children's growth and development (33). Moreover, it was following normal developmental stages. Based on the observations, the researcher assumed that applying maternal role care according to the intention-based maternal role attainment module can help mothers play a good role in stimulating children to improve their cognitive development.

The results showed differences in the effect of applying maternal role (maternal role identity) according to the intention-based maternal role attainment module on cognitive development in normal children aged 1-3 years. Nursalam's study (2005) said that providing repeated and continuous stimulation in every aspect of child development has provided opportunities for children to grow and develop optimally (34). Nerve cells form a new connection to store information. Cells that store information will expand, while those that are rarely or unused will perish. This is the importance of stimulation that is routinely given. The stimulation will strengthen the relationship between the nerves formed so that brain function will automatically improve (35). Toddler-age children need regular stimulation as early as possible and continuously at every opportunity. Lack of stimulation can cause deviations in growth and development and even cause permanent disturbances (34). Parents, especially mothers, play a role in raising children and providing education to children so that children's development is optimal. This is

evidenced by a previous study, which concluded that parents who give a stimulus could positively impact children's growth and development (33). Moreover, it was following normal developmental stages. Based on the results of observations, researchers assumed that applying good parenting in providing stimulation to children could improve their cognitive development.

CONCLUSION

It can be concluded that there is a significant increase in the value of cognitive development in stunted children aged 1-3 years before and after the intervention for the application of maternal role identity according to the intention-based maternal role attainment module in stunted and normal children. The application of the role of maternity care is an important part, so there is a need for socialization among cadres and health workers to increase health coverage and children's cognitive development.

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The experience of nurses conducting nursing assessments of occupational diseases in the farm: A phenomenological study

La experiencia de enfermeras realizando evaluaciones de enfermería de enfermedades profesionales en la granja: un estudio fenomenológico

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SUMMARY

Introduction: *The stages of the farming procedure are carried out sequentially. From planting preparation to harvesting, the farmer has a risk of occupational disease. Farmers will come to the first health service center if there is a health problem, and the nurse in charge will conduct nursing assessments. This study was conducted to explore nurses' experiences in conducting nursing assessments of occupational diseases in agriculture.*
Methods: *This study used a phenomenological qualitative study with a descriptive-interpretative approach. The subjects of this study were eight nurses who worked in the first health service in the agricultural area of Lumajang Regency. Data were collected and analyzed using thematic analysis based on the Braun and Clarke approach. The data were validated by triangulation and triangulation methods.*
Results: *The researchers found five major themes, namely, using all senses for assessment, using knowledge about agriculture, asking about work history in the planting process, asking about the history of the first management at the time in the agricultural area, and the perception of illness as a risk of work in agriculture.*
Conclusion: *Nurses have challenges in carrying out nursing care and must be able to adapt to the work area where their health services are located. Agricultural areas require nurses' knowledge to provide nursing care that focuses on problems in the agricultural area. Assessment as an initial action in the nursing care process requires specific knowledge and skills following the work area of health services. It is hoped that in the future, more special nursing care will be developed following the work.*

Keywords: *Agriculture, experience, nurse, nursing care.*

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RESUMEN

Introducción: *Las etapas del procedimiento de cultivo se realizan secuencialmente. Desde la preparación de la siembra hasta la cosecha, el agricultor tiene riesgo de enfermedad profesional. Los agricultores acudirán al primer centro de atención de salud si hay un problema de salud y la enfermera a cargo realizará las evaluaciones de enfermería. Este estudio se realizó para explorar las experiencias de las enfermeras en la realización de evaluaciones de enfermería de enfermedades profesionales en la agricultura.*
Métodos: *Esta investigación utilizó un estudio cualitativo fenomenológico con un enfoque descriptivo-*

interpretativo. Los sujetos de este estudio fueron ocho enfermeras que trabajaban en el primer servicio de salud en el área agrícola de Lumajang Regency. Los datos fueron recolectados y analizados utilizando un análisis temático basado en el enfoque de Braun y Clarke. Los datos fueron validados por métodos de triangulación y triangulación.

Resultados: *Los investigadores encontraron cinco grandes temas, a saber, usar todos los sentidos para la evaluación, usar el conocimiento sobre agricultura, preguntar sobre la historia del trabajo en el proceso de siembra, preguntar sobre la historia del primer manejo en el momento en el área agrícola, la percepción de la enfermedad como un riesgo del trabajo en la agricultura.*

Conclusión: *Las enfermeras tienen desafíos en la realización de los cuidados de enfermería y deben ser capaces de adaptarse al área de trabajo donde se encuentran sus servicios de salud. Las áreas agrícolas requieren del conocimiento del enfermero para brindar cuidados de enfermería enfocados en los problemas del área agrícola. La evaluación como acción inicial en el proceso de atención de enfermería requiere conocimientos y habilidades específicas siguiendo el área de trabajo de los servicios de salud. Se espera que en el futuro se desarrollen más cuidados de enfermería especiales a raíz del trabajo.*

Palabras clave: *Agricultura, experiencia, enfermero, cuidado de enfermería.*

INTRODUCTION

Nursing care is an indicator in determining the quality of health services carried out by nurses as caregivers. The most important aspect of nursing services is nursing documentation (1-3). If the documentation is not carried out properly, it will cause quite a big problem. Therefore, nurses are always required to have expertise and knowledge in carrying out their roles, functions, and responsibilities in providing nursing care. Skills and expertise in nursing are the results of knowledge and clinical experience that have been carried out to make complex decisions and interpret clinical situations in providing professional and quality nursing care due to changes in health needs and community demands as well as government policies related to nursing and health services (4-6).

As is well known, assessment in nursing is the initial stage of the nursing process. It is a systematic process of collecting data from various sources to identify and evaluate the client's health status. In addition, the assessment is a rationale for providing nursing care in accordance with patient needs. There are three critical points in this study. The first is the stage of collecting data obtained for primary data, focus data, subjective data, and objective data. The second is in the form of nursing data sources, where you get the data sources such as primary and secondary data sources and other data sources such as medical records, disease history, and so on. Third, carrying out the assessment requires appropriate nursing data collection techniques by taking anamnesis, observation, and physical examination of the patient (4,7,8).

The role of nurses is critical in providing health services for patients (9,10). Several studies have explained that nurses' professional behaviour is related to the patient's recovery rate (11-13). In the agricultural sphere, it is the management of care and nursing services in the agricultural sphere that focuses on individuals, families, groups, and even communities that are holistic and comprehensive. Agronursing aims as a forum to meet the health needs of the community in the agricultural environment.

Indonesia is an agricultural country, so most Indonesian workers, especially in rural areas, work in the agricultural sector as farmers with many health risks. For this reason, nurses need to carry out data collection actions correctly for farmers in carrying out nursing care actions in accordance with the diagnoses experienced by farmers. If the nursing management is in accordance with the diagnosis, nursing services to farmers are maximized, and farmers' health level also increases (12).

Agriculture is broadly divided into several sectors, namely food crops consisting of secondary crops, horticulture, and rice, forestry, plantation, fisheries, and livestock sectors. In each sector, each farmer sometimes experiences various nursing problems. For this reason, it is necessary to study the nursing process in the agricultural area. With the assessment carried out completely and systematically following the field, the conditions of farmers are essential for formulating a nursing diagnosis and providing nursing care following farmers' responses as

individuals. However, materials regarding nursing assessment in agricultural areas are still few and rarely found. For this reason, "Guidelines for Agronursing-based nursing assessment" were formed with the hope of being one of the references or considerations in the implementation of nursing documentation of nurses in nursing actions in the scope of agriculture.

Working as a farmer has procedural stages in farming. The stages of the farming procedure are carried out sequentially, from planting preparation to harvesting. At each procedural stage, there is a risk of occupational disease for farmers. Farmers will come to the health care center first if there has been a health problem, and then the nurse on duty will conduct a nursing assessment. Nurses' experience in conducting nursing assessments on occupational diseases in agriculture has not been widely explored. This study explores nurses' experience conducting nursing assessments on occupational diseases in agriculture.

METHODS

This type of research was a phenomenological qualitative study with a descriptive-interpretative approach. The informants were based on the saturated sampling technique, eight nurses who worked in the first health service in the agricultural area of Lumajang district. The variables included knowledge, work history, first management, and perception in nursing assessment. The instruments used in this study were interview guidelines and a checklist. We collected data by conducting in-depth interviews with informants and observations. Each variable was asked of informants using a checklist and interview guidelines. When conducting research, the researcher directly observed using a checklist. Data were collected and analyzed using thematic analysis based on the Braun and Clarke approach (14). Triangulation was carried out using a source to maintain the validation of the data collected. This research has received ethical approval from the Health Research Ethics Commission, Faculty of Dentistry, Universitas Jember, with an ethical approval number No.982/UN.25.8/KEPK/DL/2020 dated August 26, 2020.

RESULTS

The final sample consisted of 8 participants. Demographic information is summarised in Table 1. Eight nurses who worked in the first health service in the agricultural area participated. Most participants have more than four years of working experience in emergency units.

Researchers produced five significant themes: using all the senses for assessment, using knowledge about agriculture, asking for work history in the planting process, asking for the history of the first management in the agricultural area, and the perception of illness as a risk of work in agriculture.

Table 1

Participant Demographic Characteristics

Participant	Gender	Age	Length of work (years)	Workplace Experience
1	Male	25	4	Emergency Unit
2	Male	30	9	Emergency Unit
3	Female	24	4	Emergency Unit
4	Male	35	14	Emergency Unit
5	Female	27	6	Emergency Unit
6	Female	28	7	Emergency Unit
7	Male	26	5	Emergency Unit
8	Male	33	13	Emergency Unit

Using all senses for assessment

Using the senses here means that nurses use their sensors to carry out nursing assessments quickly. The participant's statement can be seen below:

"…when the patient comes must be able to see from his appearance a farmer or not …." (P1)

"…. There are patients who come with the smell of pesticides, so you have to be careful …." (P3)

Using knowledge about agriculture

The use of knowledge about agricultural science here means that in carrying out nursing assessments, nurses need to know agricultural science to understand the causes of problems due to work in agriculture. The following is a participant's statement that fits the theme:

'…..Farmers often come to health services because they run out of pesticide spray. Usually, they feel nauseous …" (P2)

'…..when the planting season must come because of trauma from a sharp object, usually it gets hit by plant residues …" (P4)

Asking for work history in the planting process

Agriculture is a stage of the farming process. Nurses need information on the work carried out at the stages of the planting process. Each stage in the planting process has its type of work. Participants' statements can be seen below**:**

"…..During the planting season, farmers' health problems that arise also vary depending on what they are working on …." (P4)

"……..As usual, we ask for the history of the disease, but the difference is, ask what are you doing in the planting season …" (P5)

Asking for the history of the first management in the agricultural area

Farmers' first aid when health problems occur is adjusting to the surrounding environment. The first management is something that the nurse needs to review once brought to the health service. Participants' statements can be seen below:

"…. because usually if you get hit by a hoe, you are given pain, so you have to ask first what to do …." (P1)

"…..should be asked what treatment has been given, usually various …" (P6)

The perception of illness as a risk of working in agriculture

Sickness as a job risk in agriculture means that farmers understand the risks of their work but consider the risks normal. Participants' statements can be seen below:

"…… It's considered a backache after a dig is normal, even though it can be dangerous, if you're not strong, just come here (Emergency Department) …" (P3)

"…… Farmers come here (ED) after they can't stand the pain, they are considered normal …." (P5)

DISCUSSION

Mortality and morbidity due to exposure to sustainable agricultural pesticides are global problems. Food and Agriculture Organization (FAO) estimates indicate that approximately 2.7, 6.5, 240, 11.3, and 4.5 million kg of obsolete pesticides are available in Africa, Asia, Eastern Europe, Latin America, and the Middle East. Organochlorides, organophosphates, inorganic pesticides, and certain biopesticides are some of the most commonly used pesticide classes (15)

Pesticides have led to an increase in agricultural production worldwide. However, when not applied safely, they can cause environmental pollution and adverse health effects, sometimes irreversible (16). Using all the senses for assessment exposure to organophosphate pesticides can occur through various pathways, including food contamination, environmental and household contamination, proximity to agricultural fields, and agricultural work (17). However, pesticide exposure by skin has been

identified as the main route that contributes the most among workers, particularly pesticide handlers who mix, load, and apply pesticides (18). Exposures are generally assessed with questionnaire data on self-reported exposures. Estimates of the prevalence of occupational exposure to ergonomic risk factors are provided for the five included studies, disaggregated by country, sex, 5-year age group, industrial sector, or occupational group where applicable. The combined prevalence of each exposure to ergonomic risk factors was 0.76 (95 % confidence interval 0.69-0.84, 3 studies, 148,433 participants, 35 countries in the World Health Organization (WHO) European region, 12 100 %, low quality of evidence). Subgroup analysis found no statistically significant differences in exposure by sex but differences by age group, occupation, and country. No evidence was found for publication bias. We judged this evidence to be of low quality based on serious concerns about the risk of bias. Exposure assessments are only self-reported and indirectly due to evidence from two WHO regions.

The various health problems were 28.5 % underweight, 10.6 % overweight, 62.6 % anaemia, and 50.3 % joint and bone pain. Using knowledge about agriculture in these results suggests that getting older and drinking coffee increases the likelihood of being thin while having less than 30 minutes of rest per work period and working more than five days per week decreases the likelihood of being overweight. Meanwhile, being a younger man and working for less than five days per week lowered the risk of anaemia. Furthermore, age and less than 30 minutes of rest per work period were associated with increased joint and bone pain (19). Skin protection behaviour of men and women in agriculture remains low. Differences in study design and investigated behaviour make it difficult to draw conclusions or detect trends. Nevertheless, skin cancer is on the rise and is now the most expensive cancer in Australia (20).

Asking for work history in the planting process is the fact that plant protection drugs have been applied not according to the instructions and do not guarantee safety can cause poisoning, and shock seriously affects the health of farmers and even lead to death. The results showed that there are still many problems regarding farmers' awareness and habit of using pesticides in Tu Ky district, Hai Duong province (21). Furthermore, the mediated model shows that working hours increase unsafe behaviour, whereas work experience decreases it. Unsafe behaviour, in turn, shows a positive relationship with accidents through near-miss mediation (22). Among all injuries, injuries such as skin injuries, skin friction, superficial vein injuries, injuries to the toes or fingers, and muscle tension were recorded as the severity of AIS 1. In contrast, injuries to limbs, deep vein injuries, permanent loss of any body part, and infection of the injured limb were considered to be between the severity of AIS 2 and AIS 3 injuries (23).

Occupational health nurses are familiar with the environmental exposures workers face in their workplaces. Asking for the history of the first management in the agricultural area, for example, employees only "work" about a third of each workday, with many potential exposures to other environments that could affect their health. This article discusses some of the main exposures employees face outside the workplace — air, water, soil pollution, and hazardous waste — including a discussion of well-known national and international environmental incidents. The primary sources of these pollutants and how they pollute the environment are investigated. Lastly, risk assessment, communication, and effective strategies for educating employees and the public are presented (24).

Nurses are regularly asked to care for employees from various cultural backgrounds in an increasingly multicultural society. The perception of illness as a risk of working in agriculture because of awareness of cultural differences focuses occupational health nurses on these differences and improves employee care. This article discusses caring for culturally competent employees, non-verbal communication cues among cultural groups, models associated with completing cultural assessments, and how health disparities in the workplace can affect employee care delivery. Self-evaluation of occupational health nurses for personal preferences and biases is also discussed. The development of cultural competence is a process, and occupational health nurses must develop these skills. By developing cultural competence, occupational health nurses can perform a complete cultural assessment, facilitate better communication with employees from different cultural backgrounds, and improve

employee health and adherence to treatment regimens. Tips and guidelines to facilitate communication between occupational health nurses and employees are also provided (25).

Occupational health care promotes and restores health, preventing illness and injury, protecting occupational and environmental hazards, and company profitability. Quality education about the relationship between work and health is critical to nurses' success, regardless of the work setting (26). It is consistent with goals but lacking or limited in some programs. This report introduces an innovative occupational health nursing curriculum for students in the baccalaureate nursing program. The process of designing and piloting this new curriculum, its alignment with nursing competencies, and the format and learning activities are explained (27).

Shoulder pain is a common complaint in the workplace. Shoulder conditions may arise from acute trauma or non-traumatic work-related activities. Shoulder pain falls into three categories: acute pain, chronic pain, and referral pain. The occupational health nurse can document a detailed medical history and physical examination based on focused complaints. The nurse's expert assessment can guide injured workers to needed care, case management, and return to full employment (28).

CONCLUSION

Nurses who have challenges in carrying out nursing care must be able to adjust to the work area where the health service is located. Agricultural areas require nurses' knowledge in providing nursing care that focuses on problems in the agricultural area. As an initial action in the nursing care process, assessment requires special knowledge and skills from the health service work area. It is hoped that in the future, there will be a lot of special nursing care developed following the work.

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Relationship between stigma and quality of life in people with pulmonary tuberculosis in East Java, Indonesia

Relación entre el estigma y la calidad de vida en personas con tuberculosis pulmonar en Java Oriental, Indonesia

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SUMMARY

Introduction: *The social experience makes rejection from society of people with pulmonary tuberculosis depressed and worsens their quality of life. Thus, is should be reducing the social stigma that exists in society, namely improving the pattern of quality of life and good self-perception in patients. The aim of this study was an overview of social stigma and quality of life in people with pulmonary tuberculosis in East Java, Indonesia.*
Methods: *This study used analytics with a cross-sectional approach design. The study population consisted of 2 groups of 65 tuberculosis patients, and 65 were families. A large sample of 2 groups consisted of tuberculosis patients, 55 respondents, and 55 families. The sampling technique used total sampling; data was collected using a questionnaire sheet. The data were analyzed using the Chi-Square test with an* $\alpha = 0.05$.
Results: *The results showed that most (60 %) families have bad social stigma and most (58.2 %) tuberculosis patients have a poor quality of life. Chi-Square test results p-value = 0.007 and* $\alpha = 0.05$, *which means there is a relationship between stigma and social quality of life for tuberculosis patients in Indonesia.*
Conclusion: *The worse the social stigma in the family, the worse the quality of life for tuberculosis patients. It is expected that the family will provide full support to tuberculosis patients in terms of their quality of life so that the patient's physical health is improved.*

Keywords: *Pulmonary, quality of life, review, social stigma, tuberculosis.*

RESUMEN

Introducción: *La experiencia social hace que el rechazo de la sociedad a las personas con tuberculosis pulmonar, lo que genera depresión y empeora la calidad de vida de los pacientes. Por ello, es necesario reducir el estigma social que existe en la sociedad, es decir, mejorar el patrón de calidad de vida y la buena autopercepción de los pacientes. El objetivo del estudio fue la descripción general del estigma social y la calidad de vida de las personas con tuberculosis pulmonar en Java Oriental, Indonesia.*
Métodos: *Este estudio utilizó análisis con un diseño de enfoque transversal. La población de estudio consistió en 2 grupos de 65 pacientes con tuberculosis, y 65 eran familias. La gran muestra de 2 grupos consistía en pacientes con tuberculosis, 55 encuestados y 55 familias. Se empleó la técnica de muestreo total, instrumento de recolección de datos mediante una hoja*

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de cuestionario. Los datos se analizaron mediante la prueba Chi-Cuadrado con un $\alpha = 0,05$.
Resultados: *Los resultados mostraron que la mayoría (60 %) de las familias tienen estigma social y la mayoría (58,2 %) de los pacientes tuberculosos tienen una mala calidad de vida. Los resultados de la prueba de Chi-cuadrado valor p = 0,007 y* $\alpha = 0,05$, *lo que significa que existe una relación entre el estigma y la calidad de vida social de los pacientes con tuberculosis en Indonesia.*
Conclusión: *Cuanto mayor es el estigma social en la familia, peor es la calidad de vida de los pacientes tuberculosos. Se espera que la familia brinde todo el apoyo a los pacientes tuberculosos en cuanto a su calidad de vida para que la salud física del paciente mejore.*

Palabras clave: *Pulmonar, calidad de vida, revisión, estigma social, tuberculosis.*

INTRODUCTION

Tuberculosis is a global public health problem with the highest mortality rate among other people (1-6). One in 10 causes of death worldwide is tuberculosis, and 1.5 million people die (7,8). Indonesia ranks second in the world as the most significant contributor to tuberculosis patients after India (9,10). In 2015, the Case Detection Rate (CDR) of pulmonary tuberculosis in Indonesia was recorded at 125 cases per 100 000 population. In the last statistical data in 2018, there were 324 539 cases in Indonesia (6,11,12). In some countries, tuberculosis patients are spreading infectious diseases, which leads to a rejection of the presence of tuberculosis patients in the community over a very long time (13,14).

The social stigma that occurs in tuberculosis patients causes them to feel isolated from their family, friends, and people around them (15,16). This causes tuberculosis patients to experience prolonged fear and anxiety (17-19). Anxiety in tuberculosis patients due to social stigma causes psychological disorders associated with lower enjoyment of life and demotivation, which implies lower functional capacity and quality of life (20,21). Therefore, the quality of life in tuberculosis patients is essential because it will affect several aspects of life (22-25).

Social stigma for tuberculosis patients occurs in society caused by tuberculosis is a shameful and frightening disease. It can be reduced by improving people's knowledge and perception of tuberculosis (17,22). The results of the study state that knowledge, attitudes, and behaviors indicate that 76 % of families have heard of tuberculosis, 26 % can mention two major signs and symptoms, and 51 % understand how it is a contagion. Only 19 % know tuberculosis control programs provide free medication (26).

The risk of developing tuberculosis appears to increase in some areas, indicating that the prevalence of tuberculosis in the community is also high (27,28). The increase in prevalence is often due to people's knowledge, attitudes, and behavior toward people with tuberculosis providing social stigma (29-31). Because of the social stigma that occurs in tuberculosis patients will cause their motivation for life to be low (22,30). The negative stigma against tuberculosis causes prolonged physical and psychological pain (13,32). Tuberculosis is a disease with social implications due to the stigma attached to psychology in society (7,13). Negative stigma against tuberculosis will further strengthen the condition of patients who feel isolated from people's lives, and this will cause the life quality of tuberculosis patients to get worse (29,33).

Physical and psychological conditions affected by tuberculosis patients significantly affect the quality of life because they are both domains of quality of life, so it is not uncommon for patients with tuberculosis to have a low quality of life due to depression experienced (10,34). Depression and social stigma will affect how tuberculosis patients undergo disease processes and decrease their quality of life (12,35). Decreased quality of life in tuberculosis patients can cause delays in treatment and negatively impact treatment continuity. This leads to severe or incomplete treatment (22,36).

The decreased quality of life in tuberculosis patients is due to several factors affecting socio-demographics, including gender, age, education level, occupation, income, marital status, and drug adherence (37,38). Because tuberculosis patients obediently take the drug will improve their quality of life, decreasing morbidity and death of tuberculosis patients (17,39). Efforts to overcome social stigma in tuberculosis patients are to change the social stigma that exists in

society by improving knowledge and good self-perception in tuberculosis patients, which are predicted to trigger an improvement in the quality of life of patients (40,41). Improving the quality of life means increasing the expectation of tuberculosis patients to get a total recovery both physically and psychologically (15,42). Based on this, the researchers felt the study was important, so the researchers were interested in further examining how social stigma relates to the quality of life of tuberculosis patients (43,44). Looking at some of the problems experienced by pulmonary tuberculosis patients concerning physical and psychological conditions. This study aims to examine the relationship of social stigma with the quality of life of tuberculosis patients in East Java.

METHODS

This study used descriptive with a cross-sectional approach design. The research sample was tuberculosis patients treated at the Perak Timur Health Center in Surabaya. Data collection through questionnaires sent via google form to respondents in the WhatsApp group. The stigma questionnaire includes community acceptance, family acceptance and social environment conditions, and quality of life, consisting of 26 questions covering physical health, psychological health, social relationship, and environmental health. The researcher created the stigma and quality of the live questionnaire and tested its validity and reliability with an alpha Cronbach of 0.518 and a validity level of 0.0001. The variables in this study are social stigma and quality of life. This study measured social stigma based on the community's view of tuberculosis patients in this study. Some indicators, namely social stigma, can sympathize with the community, categorized as a good stigma. On the other hand, social stigma also can give rise to discriminatory behaviors from the society that is classified as bad.

The population in this study is all tuberculosis patients and families who are still active in community health centers at Surabaya in 2 groups, namely 65 families and 65 people who are tuberculosis patients. Sample research with inclusion criteria is tuberculosis patients who are routinely in the health center and have been suffering from the disease for more than two years. Exclusion criteria are pulmonary tuberculosis patients who have the comorbid disease. Therefore, this study was 55 respondents' families with tuberculosis patients and 55 respondents with tuberculosis patients, with a total sampling technique.

Data collection in this study uses primary data which researchers provide social stigma questionnaires and quality of life. Respondents are given a seat to allow them, respondent to answer calmly and comfortably. Respondents were given questionnaires and briefed before filling out questionnaires. Then the respondent fills in the respondent's identity. While filling out the questionnaire, the respondent was under the supervision and guidance of the researcher.

The data was analyzed to determine the relationship between stigma variables and quality of life variables using tabulation. To find the relationship between social stigma and quality of life, the collected data were processed and analyzed using the Chi-Square test using SPSS with a level of meaning $\alpha = 0.05$. All participants in this study have been given an explanation by the researcher and their consent to be involved in this research.

RESULTS

Based on Table 1 concerning respondents distribution characteristics in the tuberculosis patient, 55 respondents consisted of 34 male respondents with a percentage number 61.8 % and 21 female respondents with a percentage number 38.2 % and in families of tuberculosis patients consisted of 23 male respondents with a total percentage 41.8 % and 32 female respondents with total percentage 58.2 %. The 14 respondents were equal percentages of 25.5 % between the aged 17-25 years (late teens) and 36-45 years (late adults). But the highest-equal in family's number are aged 36 – 45 and 45 – 55 with total percentage 27.3 %. While in tuberculosis patients out of 55 respondents, most of the respondents are 70.9 % worked privately and family respondents, and with tuberculosis out of 55 respondents 54.5 % worked privately.

Table 1

Frequency Distribution characteristics of respondents

Characteristics of Respondents	Tuberculosis patients		Familieswith tuberculosis	
	n	%	n	%
Gender				
Male	34	61.8	23	41.8
Female	21	38.2	32	58.2
Age (years)				
17 - 25	14	25.5	13	23.6
26 - 35	7	12.7	12	21.8
36 - 45	14	25.5	15	27.3
46 - 55	8	14.5	15	27.3
56 - 65	9	16.4	0	0
>65	3	5.5	0	0
Occupations				
Private sector	39	70.9	30	54.5
Civil servants	2	3.6	3	5.5
Housewives	9	16.4	22	40.0
Fishing	0	0	0	0
Not Working	5	9.1	0	0
Education				
No School	4	7.3	0	0
Elementary School	17	30.9	15	27.3
Secondary School	32	58.2	38	69.1
College	2	3.6	2	3.6
Total	55	100	55	100

Source: Primary data, February 2020

Table 2 concerning social stigma and quality of life showed that 60 % of families with tuberculosis had a bad stigma against TB disease. 55 respondents, with 22 respondents' patients having good social stigma (40 %), 33 respondents' patients have a bad social stigma (60 %), the families having good social stigma with a total number of 15 respondents (20 %), and families having bad social stigma with a total number of 40 respondents (80 %). total percentage of 58.2 % of tuberculosis patients with poor quality of life. 33 respondents, with 72.7 % of families had a bad social stigma and poor quality of life, while about 22 respondents, most of the 63.6 % had a good social stigma and good quality of life. Chi-Square statistical test result with meaning value $\alpha = 0.05$, obtained value $X^2 = 0.007$, which means there is a relationship between social stigma and the quality of life of tuberculosis patients.

Table 2

Frequency Distribution of Respondents Based on Social Stigma and Quality of life

	Patients		Family	
	N	%	n	%
Social Stigma				
Good	22	40	15	20
Bad	33	60	40	80
Quality of life				
Good	23	41.8	20	38
Bad	32	58.2	35	62

Chi-Square test $X^2 = 0.007$

DISCUSSION

The social stigma in families with tuberculosis tends to be bad for family members affected by tuberculosis and is considered a source of family support (36,45). Social Stigma is a negative trait that attaches to a person's personality due to its environmental influence. This stigma may encourage a person to have prejudiced thoughts, behaviors, or actions by the government, society, employers, health care providers, co-workers, friends, and family (23,46). In addition, stigma restricted education, employment, housing, and health care (47,48).

Stigma can be experienced as shame or guilt or can be widely expressed as discrimination. This can lead to decreased confidence, loss of motivation, withdrawal from social life, avoidance of work, interaction in health, and loss of time planning (28,40). Stigma also means a phenomenon that occurs when a person is labeled, stereotyped, separated, and experiences family discrimination with tuberculosis. More assumes that the person affected by tuberculosis will transmit his disease to all members of his family, which makes the family more distanced from the patients (35,42).

The highest domain in measuring tuberculosis stigma for patients from tuberculosis is the fear of transmission of the disease, so a correct understanding of tuberculosis should be a concern (43). Therefore, for people with tuberculosis, the most important thing is to survive the stigma to give others a true understanding

of tuberculosis. This study found about 34 respondents were mostly 61.8 % male. Based on lifestyle patterns, men are more at risk of tuberculosis with smoking habits, nighttime, and susceptibility to tuberculosis if exposed to tuberculosis (28,48). This age is an age of responsibility and burden on the family for a father who has a responsibility to his family and works as the backbone (46,49). Factors affecting the quality of life are gender, age, education level, occupation, income, and marital status (33,50).

The quality of life is a person's perception in the context of culture and norms that correspond to the person's place of life and are related to the purpose and expectation of the standard of care during their life (40,51). The quality of life of individuals with each other is different, and it depends on the definition or interpretation of each individual about good quality of life (37,52). Based on the understanding of the quality of life above can be concluded that the quality of life is the perception of the individual towards their position in life. This is related to physical health problems, psychological status, level of freedom, and social and environmental relationships (22,26). Individuals can be said to have a good quality of life if known aspects of life that the individual is not easily sick accelerate the healing process and become an important consideration in the effort to prevent the appearance of the disease (20,37). Several factors affect it, such as gender, age, education level, employment, income, marital status, drug compliance, and the social stigma in families and residential environments (42,53).

This study found a correlation between social stigma and the quality of life of tuberculosis patients. This can prove a relation between social stigma and the quality of life for tuberculosis patients. This can be seen from cross-tabulation analysis that 33 respondents, mostly 72.7 % of families have bad social stigma and poor quality of life, while of the 22 respondents, with an overall percentage of 63.6 % have good social stigma and good quality of life.

Based on the data, the higher is stigma, the lower is quality of life. Tuberculosis patients' low quality of life of tuberculosis patients occurs due to decreased physical health and high stigma (18,42). This means that when tuberculosis patients have a good stigma, the quality of life will be high and speed up the healing process of tuberculosis patients because aspects of their quality of life are fulfilled (28,54). Regarding the relation between social stigma with quality of life, respondents have low social stigma toward the disease, 51 respondents or in percentage is (53.1 %). And about 31 respondents had a good quality of life, while in patients with high stigma, 45 (46.9 %) at most 17 hospitals have a moderate quality of life. Amount of 31 respondents had a good quality of life, while in patients with high stigma, 45 respondents (46.9 %) at most 17 hospitals have a moderate quality of life.

CONCLUSION

There is a relationship between social stigma with quality of life. For example, a family does not have a bad perception of tuberculosis patients and supports routine treatment so that the tuberculosis patients will increase and accelerate recovery. Health workers should develop strategies that can eliminate community stigma in people with pulmonary tuberculosis through an individual approach or community leaders.

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ARTÍCULO ORIGINAL

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Synthesis of manganese nanoparticles of Oolong tea extract by sonication method for a natural oral contrast media on magnetic resonance cholangiopancreatography

Síntesis de nanopartículas de manganeso de extracto de té Oolong mediante el método de sonicación para un medio de contraste oral natural en colangiopancreatografía por resonancia magnética

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SUMMARY

Introduction: *Magnetic resonance cholangiopancreatography examination using natural contrast media has not provided an optimal image of gastroduodenal suppression that covers the image of the biliary system. Natural materials used as contrast media continue to be developed with various previous studies, but not many have been associated with using nanoparticles as natural contrast media materials. This study aims to make manganese nanoparticles in oolong tea extract used as an oral contrast medium.*
Methods: *In this experimental study, the extraction of oolong tea using the boiling method with 15 mL of distilled water was dissolved in 200 mL of distilled water and then sonicated with a frequency of 20 kHz with time variations of 10, 15, 20, and 25 minutes. The results of the sonication process carried out a Particle Size Analyzer (PSA) test. Furthermore, the obtained manganese nanoparticles were given orally to healthy volunteers, and a Magnetic Resonance Cholangiopancreatography (MRCP) examination was performed.*
Results: *The resulting MRCP image measures the Signal to noise ratio (SNR) value in the stomach, duodenum, and biliary tract system. Synthesis of manganese nanoparticles with the sonication method showed that sonication for 10 minutes resulted in manganese particle sizes with a diameter of 1 364.8 nm, 15 minutes with a diameter of 1 204.7 nm, 20 minutes with a diameter of 488.2 nm, 25 minutes with a diameter of 1131.8 nm. The results with the particle size with a diameter of 488.2 nm are nanoparticles, then used for MRCP examination.*
Conclusion: *Manganese nanoparticles from oolong tea extract can suppress objects covering the pancreatic biliary tree system, increasing contrast enhancement in the pancreato biliary tree system.*

Keywords: *Magnetic resonance cholangiopancreatography, manganese, nanoparticles, Oolong tea.*

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RESUMEN

Introducción: *El examen de colangiopancreatografía por resonancia magnética con medios de contraste naturales no ha proporcionado una imagen óptima de supresión gastroduodenal que cubra la imagen del sistema biliar. Los materiales naturales utilizados como medios de contraste continúan desarrollándose con varios estudios previos, pero no muchos se han asociado con el uso de nanopartículas como materiales de medios de contraste naturales. Este estudio tiene como objetivo hacer nanopartículas de manganeso en extracto de té oolong utilizado como medio de contraste oral.*

Métodos: *En este estudio experimental, la extracción de té oolong utilizando el método de ebullición con 15 mL de agua destilada se disolvió en 200 mL de agua destilada y luego se sonicó con una frecuencia de 20 kHz con variaciones de tiempo de 10, 15, 20 y 25 minutos. Los resultados del proceso de sonicación llevaron a cabo una prueba de analizador de tamaño de partículas (PSA). Además, las nanopartículas de manganeso obtenidas se administraron por vía oral a voluntarios sanos y se les realizó un examen de colangiopancreatografía por resonancia magnética (CPRM).*

Resultados: *La imagen de MRCP resultante mide el valor de SNR (Signal to noise ration, por sus siglas en ingles) en el estómago, el duodeno y el sistema del tracto biliar. La síntesis de nanopartículas de manganeso con el método de sonicación mostró que la sonicación durante 10 minutos dio como resultados tamaños de partículas de manganeso con un diámetro de 1 364,8 nm, 15 minutos con un diámetro de 1 204,7 nm, 20 minutos con un diámetro de 488,2 nm, 25 minutos con un diámetro de 1131,8 nm. Los resultados con el tamaño de partícula con un diámetro de 488,2 nm son nanopartículas, luego se utilizan para el examen MRCP.*

Conclusión: *Las nanopartículas de manganeso del extracto de té oolong pueden suprimir los objetos que cubren el sistema del árbol biliar pancreático, mejorando el aumento de contraste en el sistema del árbol biliar pancreático.*

Palabras clave: *Colangiopancreatografía por resonancia magnética, manganeso, nanopartículas, té Oolong.*

INTRODUCTION

Several studies to find the alternatives to natural negative oral contrast media in Magnetic Resonance Cholangiopancreatography (MRCP) examination have been carried out, in the form of liquid or juice, both in fruits and tea drinks, which contain a lot of manganese (Mn) (1). A study on fruits as an alternative to natural negative oral contrast media, and their Mn content is blueberry (3-4 mg/dL) (2,3), pineapple (0.276 mg/dL) (4,5), blackberries (2.93 mg/dL) (6), lemon or orange (0.2 mg/dL) (7), and black tea (0.44 mg/dL) (8).

MRCP examination uses oolong tea as a contrast medium because oolong tea has a high manganese content (0.94 mg/dL) compared to other natural ingredients. The function increases the contrast between the bile ducts and surrounding organs (9). However, the limitation of using oolong tea is the level of suppression or suppression of the signal intensity of the stomach and duodenum is still not optimal, so it is still possible that there are pathological conditions that cannot be visualized optimally (10,11). To overcome this limitation, it is necessary to develop further research on the use of oolong tea as a natural negative oral contrast medium by increasing the effectiveness of the manganese content of oolong tea using nanoparticle technology.

Nanoparticle technology has been widely used in Magnetic resonance imaging (MRI), especially in materials containing magnetic nanoparticles (MNP), for developing MRI contrast media materials (12-15). Nanoparticles are a technology that aims to develop the dosage form size in a 10-1 000 nm size range. To produce nano-sized particles, several methods are used, one of which is sonication. This study aims to determine the best sonication time to produce manganese nanoparticles from the oolong extract and whether it can suppress the organs that interfere with the MRCP examination.

MATERIAL AND METHODS

Materials

Oolong tea extract is obtained from tea leaves (Camellia Sinensis) from Kemuning Village, Central Java, Indonesia, and processed using evaporated distilled water. In preliminary studies using Atomic Absorption Spectrometry (AAS) tests on several types of tea drinks, it is known

as oolong tea has the highest Manganese content (0.94 mg/dL) compared to green tea (0.70 mg/dL) and black tea (0.44 mg/dL).

Methods

Oolong Tea Extraction Process

The process of extracting oolong tea leaves was conducted by maceration: 100 g of Simplicia powder of oolong tea leaves each was put into a glass container. Firstly, it must be macerated in 1 L of distilled water; when the process was finished, it was covered and leave it for two days. Next, while protected from light, frequently stirred, shredded, squeezed, and washed the dregs with enough filter liquid to obtain 1 L. Then it was transferred to a closed vessel and leave it in a cool place. Again, it must be protected from light for two days; the second process must be bowled with boiling at a temperature of 140ºC for 5 minutes, then at 100ºC for 15-20 minutes using aqua dest solvent. The results were concentrated with a rotary evaporator type Rotavapor® R-100 until most of the solvent had evaporated. The evaporation process continued on a water tube until a thick extract was obtained.

Process for Making Nanoparticles

With 15 mL of oolong tea extract dissolved in 200 mL of distilled water and then put into the sonicator BSD-250W model. The solution was given a frequency of 20 kHz for 10, 15, 20, and 25 minutes, respectively. Then the sonication results were measured to determine the size of the manganese particles using PSA (Particle sized Analyzer).

PSA of Manganese Nanoparticle

The size of oolong tea extract manganese nanoparticles was obtained using a Cilas 1190 spectrophotometer. Each of the results of sonication of oolong tea extract for 10 minutes, 15 minutes, 20 minutes, and 25 minutes was included in PSA. This measurement is based on the scattering of laser light by the particles in the sample. The light from the laser is emitted through a pinhole (a tiny needle) and then sent to the particles in the sample. The particles in the sample scatter the light back through the pinhole and into the detector. The detected analog signal is converted into a digital signal, then processed into an arithmetic series, and the final result is a spectrum.

Magnetic Resonance Cholangiopancreatography (MRCP)

MRCP examination using MRI machine with GE Signa Voyager (1.5 Tesla). Healthy female volunteers aged 47 years were given as much as 200 mL of oolong tea extract. The MRI scanning parameters for MRCP examination were T2 weighted images with HASTE (half Fourier acquisition single shot TSE) fat saturation Coronal Thick Slab Radial to detect the suppression effect of gastrointestinal organs surrounding the biliary pancreas trees. MRI parameters scanning for bottles are TR (time repetition) 4 500 ms, TE (time echo) 700 ms, ETL (echo train length) 300, average 1, slice thickness 50 mm, scan time 50 sec. MRCP image information is assessed by assessing the signal-to-noise ratio in the pancreatic system image. This research has received permission from the Ethics Committee of the Kariadi Regional General Hospital Semarang, Central Java.

RESULTS

Size of manganese nanoparticles resulting from sonication of Oolong Tea extract, based on the results of measurements using PSA on oolong tea extract, which was sonicated with variations in time of 10 minutes (a), 15 minutes (b), 20 minutes (c) and 25 minutes (d), the spectrum was obtained as shown in Figure 1. In detail, the results PSA shows that in the 10-minute sonication process, the manganese particle size is 1 364.8 ± 267.5; in the sonication process for 15 minutes obtained, the size of 1 204.7 ±279.8; while in the 20-minute sonication process the size is 488.2 ±116.0 and in the 25-minute sonication process the size is 1 131.8 ± 275.4.

In Table 1, it can be seen that the results of sonication with manganese particle size less than

1 000 nm occurred at 20 minutes of sonication. This means that the sonication process that produces nanoparticles is only sonicated for 20 minutes, while the other process has a manganese particle size of more than 1 000 nm, so they are not called nanoparticles. PSA measurement results can be seen in Table 1.

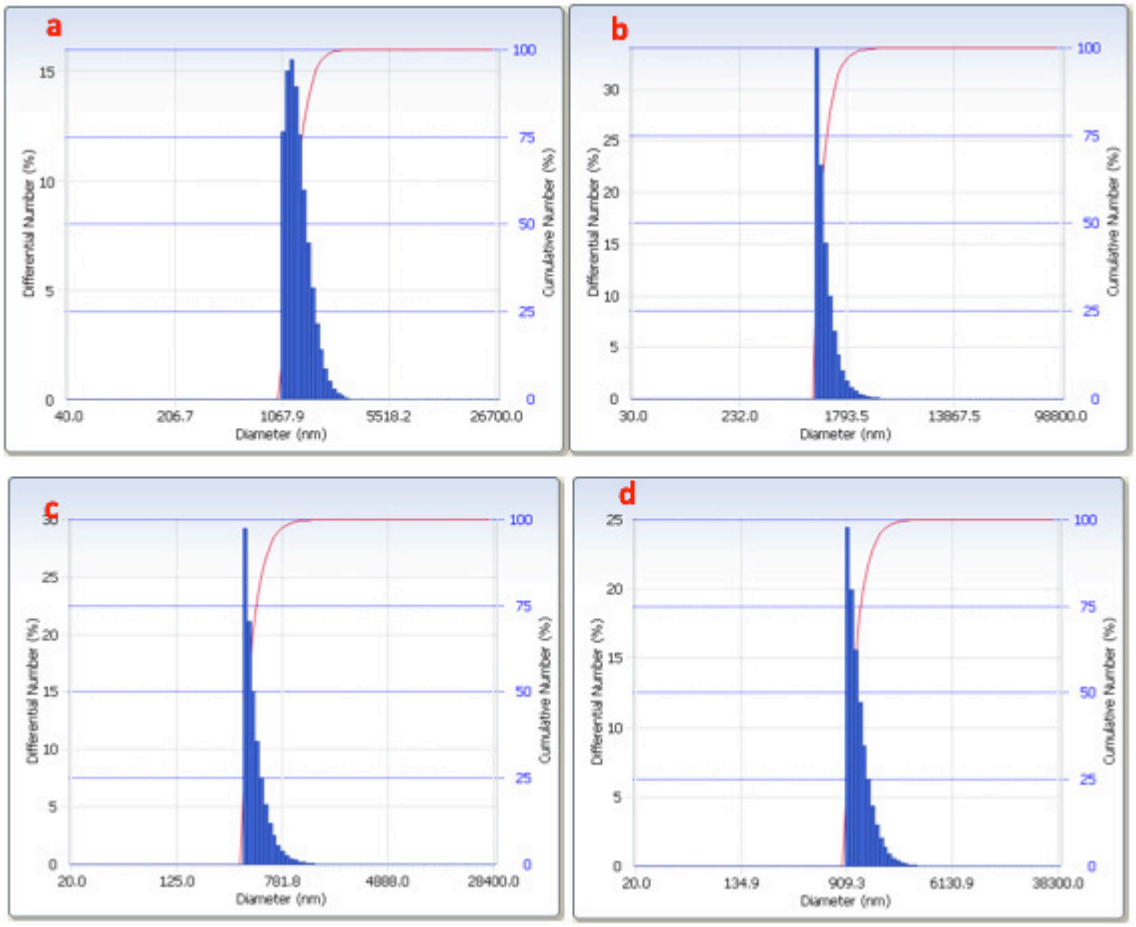

Figure 1. Particle Size Analyzer (PSA). a. 10 minutes, b. 15 minutes, c. 20 minutes, d. 25 minutes

Table 1

Diameter NP MN extract oolong tea

Sonication Time (minutes)	Diameter (nm)	Std. Dev
10	1 364.8	267.5
15	1 204.7	279.8
20	488.2	116.0
25	1 131.8	275.4

The oolong nanoparticle material obtained by sonication for 20 minutes was then given to healthy volunteers by drinking 200 mL orally. The results of MRCP scanning before and after oral administration of oolong nano particle tea contrast media can be seen in Figure 2. Where both before giving contrast (pre-contrast) and after giving contrast (post-contras), ROI (Region of interest) was made in the same organs, namely the stomach (a), duodenum (b), gall bladder (c), and common bile duct (d). Therefore, the ROI results will display their respective SNR values, as shown in Table 2.

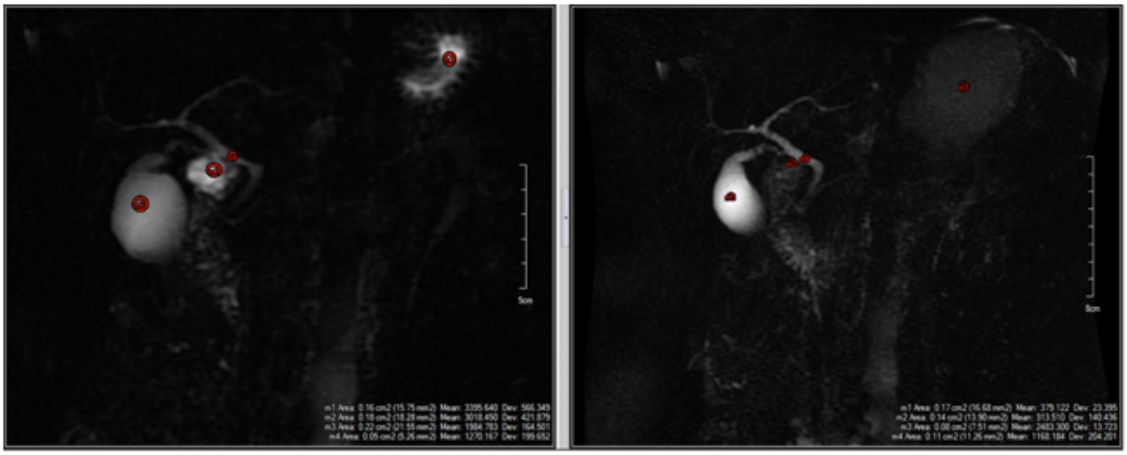

Figure 2. MRCP images of organ stomach (a) and duodenum (b) in pre and post-contrast are suppressed. Organ Gall Bladder (GB) (c) and Cammon Bile Duct (CBD) (d) in pre and post-contrast are hyperintensities.

Table 2

SNR value on MRCP the significance value is a statistical test

Organ	SNR		Sig.
	PRE	POST	
Stomach	895.14	95.12	0.006
Duodenum	758.21	81.21	0.0001
Gall Bladder (GB)	540.38	637.56	0.0001
Common Bile Duct (CBD)	326.52	300.30	0.073

Table 2 shows that the pre-contrast and post-contrast SNR values for the stomach and duodenum decreased from 895.14 to 95.12 and 758.21 to 81.21, respectively. It can be seen in the MRCP image that the stomach and duodenum images are suppressed, which initially lightens and then turns black. Meanwhile, in Gall Blader, the SNR value increased from 540.38 to 637.56, respectively, while the common bile duct decreased from 326.52 to 300.30 because the organ was superpositioned with the duodenum. The increased SNR in these organs is seen on the MRCP image with a change from hypointense to hyperintense, with contrast enhancement.

DISCUSSION

Manganese nanoparticle sonication process from oolong tea extract

Giving ultrasonic waves to a solution will cause the molecules in the solution to oscillate concerning their average position. As a result, the solution undergoes strain and density. When the ultrasonic wave energy given is large enough, the wave strain can break the molecular bonds between solutions (16-18), and the gases dissolved in the solution will be trapped due to the solution molecules whose bonds are broken when a density returns. This results in hollow balls or bubbles filled with trapped gas, known as the cavitation effect. These bubbles can have a diameter that expands to a maximum size, then contracts and shrinks so the volume decreases, some even disappearing completely. The effect of time affects the size and density of the resulting defects and the sedimentation behaviour of the dispersion of oolong tea extract nanoparticles (19).

In the process of making nanoparticles with a time of 10, 15, and 25, it produces a particle diameter size of >1 000 nm and is not a nanoparticle. The use of sonication time, which is less than 20 minutes, the process of sonication of the solution molecules whose bonds are broken

when re-densification occurs has not occurred. When the sonication time is more than 20 minutes, aggregation or agglomeration is seen in the granules of the compound, causing the particle size to appear larger. Agglomeration is the process of joining small particles into a larger structure. Agglomeration occurs due to mechanical chemical processes. The mechanical process is related to the physical binding mechanism in the high-speed milling process. High rotational speed causes greater kinetic energy, so particle collisions will occur more often, allowing materials to interact with each other and combine to form larger aggregations (16). The agglomeration process can also be caused by chemical processes such as contamination of sample powder with ball mills and tube materials. Despite having a very high hardness, stainless steel in ball mills and tubes will still contaminate the milled sample powder (16). The effect of water content that is still in the tube can also cause agglomeration. High milling speed and long time causing particle contamination from ball mills and tubes can be almost unavoidable (16). Previous research showed that too long milling time makes the nanoparticles experience agglomeration (20). With a time of 20 minutes, as seen in Figure 1, the particle diameter is 488.2 nm. In a study by coating chitosan with tea, the particle size was 407 nm (21).

Another thing, PSA testing carried out 72 hours after the sonication process can also cause agglomeration and sedimentation in samples within 10, 15, and 25 minutes. Probe sonication is an advanced way to disperse such non-inert NPS and reduce the size of the agglomerates formed. However, rapid sedimentation results in a large (30 %-80 %) difference between the nominal and the administered dose. The sonication probe also affects the metal release rate, especially when adding a stabilizer (Bovine serum albumin, BSA). However, a small effect was observed when prolonging the time (conducting energy to the dispersion) of probe sonication (22).

Manganese nanoparticles from oolong tea extract as contrast medium MRCP

In general, the MRCP examination is done without using contrast media. Still, when there is an overlap between the gastrointestinal and pancreaticobiliary systems, it will produce a picture like a pseudo structure. This overlapping state in the MRCP examination can cause an unexpected increase in signal intensity. An increase in signal intensity can lead to a misdiagnosis of between 5 % and 7 %, i.e. a normal picture is sometimes considered pathological (23,24). Misdiagnoses on MRCP examination include fluid in the stomach or duodenum, which is considered a pseudolesion in the pancreaticobiliary system. In addition, fluid located between the gastric folds, although normal, can be considered fluid in the ectatic pancreatic duct, and fluid and air in the duodenal bulb can be considered gallstones (24-26).

To overcome this problem, as an alternative, oral contrast media is used to shorten the T2 relaxation time. A short T2 relaxation time can reduce the intensity of the T2 signal of fluids in the gastrointestinal system to suppress or eliminate the picture of the gastrointestinal system so that the picture of the pancreaticobiliary system will appear clearer and not obscured by the stomach, duodenum, intestines or other organs (5,8).

Many negative oral contrast media are used for abdominal MRI examination, such as gadopentetate dimeglumine, ferric ammonium citrate, manganese chloride, kaolinite, antacids, ferristene, ferumoxil, perfluoro-octylbromide, and iron particles. Currently, this negative contrast medium is made of Mn^{2+} or $MnCl_2$ ions (0.5 – 1 mg/dL Mn-DTPA), some of which are rarely used because they are no longer produced, have an unpleasant taste, are very difficult to swallow and are relatively expensive (12,27). In addition, some contrast media is administered intravenously. The level of cellular toxicity is higher than oral administration. The plasma half-life is very short, so it is difficult to collect in the blood pool agent, and there is still retention in the basal ganglia tissue for a long examination. Contrast media such as mangafodipir trisodium, used as a negative intravenous contrast medium, showed biodistribution in mice 30 minutes after injection is 13 % in the liver, 9 % in the small intestine, 3 % in the blood, and 1.3 % in the intestine (28).

The previous study showed that oolong tea extract was used as an alternative negative contrast medium in MRCP examination because

of its high manganese content (0.94 mg/dL). In addition, the study showed that oolong tea extract increased the contrast between the images of the biliary tree and the surrounding organs. However, suppressing the stomach and duodenum is still not optimal, so it is necessary to provide a solution so that the disturbing organ can be maximally suppressed by making oolong tea extract as nanoparticles (9).

The advantage of nanoparticle-sized contrast media compared to conventional contrast media is that it has a stronger magnetic moment characteristic because the relaxometric values of T1 and T2 become higher, so the signal intensity is strengthened. Besides that, the size of the material in the form of nanoparticles can control the pharmacokinetic process to increase blood circulation time and allow the material to accumulate in the target tissue. Furthermore, the distribution of the nanoparticle material was cleared by the reticuloendothelial system (liver and spleen) (29). Besides, the taste of oolong tea can be accepted by patients and is relatively safe.

The overall difference in MRCP image information on the effect of negative oral contrast media on gastric and duodenal signal intensity and the effect of pancreatobiliary tree imagery indicates that oolong tea can be used as a negative substitution. The appearance of the gallbladder and intrahepatic ducts seen before or after oral contrast media administration of NP Mn oolong tea extract increased. The oral contrast media presentation of NP Mn oolong tea extract could distinguish between the enlarged gallbladder and Cammon Bile Duct (CBD). The intrahepatic ducts can only be seen in the right and left hepatic duct branches. In contrast, the peripheral intrahepatic ducts are barely visible due to their smaller size, which agrees with previous findings (26).

The pancreatic duct and ampulla are barely visible on all MRCP images. The pancreatic duct is slightly angled, making it difficult to see the entire pancreatic duct. The use of a single Shot Fast Spin Echo (SSFSE) sequence will show pancreatic ducts in the head (97 %), body (97 %), and tail (83 %) (26). Fasting preparations aim to reduce gastric fluid, and it is hoped that there will be a little residual fluid in the second part of the duodenum, which is useful as a marker for the presence of the distal bile duct and ampulla. Administration of negative oral contrast media helps suppress signal intensity in the gut, but the ampulla is often not visible due to regurgitation of the contrast medium into the ampulla (5). The limitation of this research is the time for the particles to persist in nano size because it uses natural materials. In a certain period, the particles will experience agglomeration. In addition, the oolong tea extract dissolved in distilled water is also prone to decay.

CONCLUSION

Nanoparticles from oolong tea extract obtained by sonication method for 20 minutes obtained manganese nanoparticles with a size of 488.2 nm. Further research is applied into practice recommended on a small scale.

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Factor analysis of the exile of women giving birth in the Forest

Análisis factorial del exilio de las mujeres que dan a luz en la selva

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SUMMARY

Introduction*: Many areas still choose childbirth helpers with non-health workers in Indonesia, such as child shamans, who often cause adverse effects for mothers and babies. This study aimed to identify factors associated with the seclusion of women giving birth in the Merauke District.*
Methods: *This study used a cross-sectional research design, with 57 mothers with toddlers as a sample. The study was conducted for two weeks, from June 29 to July 12, 2021. Data collection used secondary data and primary data. The statistics test contingency correlation.*
Results: *Based on the results of research, knowledge (p-value = 0.026), attitude (p-value = 0.028), the role of religious figures (p-value = 0.036), and the role of the husband or family (p-value = 0.020) showed a significant relationship. While culture (p-value = 0.572), accessibility to health services (p-value = 0.113), availability of health services (p-value = 0.949), the role of community leaders (p-value = 0.059), and the role of health personnel (p-value = 1,000) showed no relationship with the isolation of women.*
Conclusion: *There is a relationship between the variables of the mother's knowledge about women giving birth, the mother's attitude about women giving birth, the role of religious figures, and the role of the husband or family with the exile behaviour of women giving birth in the forest. This research suggests health service facilities in Indonesia are evenly distributed, especially in every village in Merauke District, Papua.*

Keywords: *Attitude, exile of women giving birth, knowledge, mother.*

RESUMEN

Introducción: *Muchas áreas todavía eligen ayudantes de parto con trabajadores no sanitarios en Indonesia, como niños chamanes, que a menudo causan efectos adversos para las madres y los bebés. Este estudio tuvo como objetivo identificar los factores asociados con el aislamiento de las mujeres que dan a luz en el distrito de Merauke.*
Métodos: *Este estudio utilizó un diseño de investigación transversal, con 57 madres con niños pequeños como muestra. El estudio se realizó durante dos semanas, del 29 de junio al 12 de julio de 2021. La recopilación de datos utilizó datos secundarios y datos primarios. Las estadísticas prueban la correlación de contingencia.*
Resultados: *Con base en los resultados de la investigación, el conocimiento (p-valor = 0,026), la actitud (p-valor = 0,028), el papel de las figuras*

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religiosas (p-valor = 0,036) y el papel del esposo o la familia (p-valor = 0,020) mostró una relación significativa. Mientras que la cultura (valor de p = 0,572), la accesibilidad a los servicios de salud (valor de p = 0,113), la disponibilidad de servicios de salud (valor de p = 0,949), el papel de los líderes comunitarios (valor de p = 0,059) y el papel del personal de salud (p-valor = 1.000) no mostró relación con el aislamiento de las mujeres.

Conclusión: *Existe relación entre las variables conocimiento de la madre sobre la mujer que da a luz, la actitud de la madre sobre la mujer que da a luz, el papel de las figuras religiosas y el papel del esposo o familia con el comportamiento de exilio de la mujer que da a luz en el bosque. Esta investigación sugiere que las instalaciones de servicios de salud en Indonesia están distribuidas de manera uniforme, especialmente en cada aldea del distrito de Merauke, Papúa.*

Palabras clave: *Actitud, exilio de la parturienta, saber, madre*

INTRODUCTION

The World Health Organization (WHO) estimated that around 830 women die every day only due to pregnancy complications and during the birth process (1). According to WHO, almost deaths case occurred because of things that could have been prevented in 2016 (2). One case is childbirth, carried out at home without health workers (2-5). The 2013 Basic Health Research results showed that giving birth in health facilities 70.4 %, and 29.6 % of births were carried out at home or other locations (6).

Giving birth assistants by competent health personnel (specialist doctors, general practitioners, and midwives) reached a number of 87.1 %. However, the remaining 12.9 % of birth assistants were performed by other than health workers (delivering themselves at home and/or with the help of traditional birth attendants) (7,8). In addition, some stillbirths are carried out by the mother herself or assisted by traditional birth attendants because of the vital role of customs and community culture in several regions in Indonesia. This causes the Maternal Mortality Rate (MMR) in Indonesia, based on the 2015 Inter-Census Population Survey (SUPAS), to be 305 deaths per 100 000 live births (7). Apart from partly the problem of access to unaffordable healthcare facilities, various other reasons such as economic, social, and cultural factors behind the mother's choice to give birth alone or assisted by traditional birth attendants (9-12).

In one of the districts in Papua, namely Merauke District, the maternal mortality rate in 2016 reached 17 cases. It went 13 cases in 2017. While in 2018, it went 6 cases. Besides that, it got 9 cases in 2019 and 7 cases in 2020. Data for 2020 showed that giving birth in Merauke District, which the health workers assist, has not been fully helped, seeing the target numbering 5 377 but only 4 163 being achieved, then giving birth carried out in health care facilities amounting to 4 098 of the target of 5 377 (13).

Based on a preliminary study, several ethnic groups in the Eastern Indonesia region (IBT) still have a "house of exile" culture for women giving birth. In the Jagebob sub-district, Merauke District, Papua, the house of exile (Tana Barambon Ambip) for women giving birth is called Be'vak. This tradition applies to the Yei tribe. Living in seclusion for women giving birth is a problematic condition when compared to the current development of the modern medical world. The tradition of the postpartum period for Eastern women after giving birth for 40 days in a Be'vak continues today. Newly born mothers, as are their babies, are ostracized from society and families. They are only allowed to be visited by their closest relatives and undergo some very unusual rituals for the world of health. Women who have given birth are compressed with hot water using an Eastern cloth every day with the excuse of improving blood circulation. Seeing the above factors that affect a mother in labor, the researcher is interested in conducting a study entitled factors related to the alienation of women giving birth in Merauke District.

METHODS

This type of research was quantitative research. This research was conducted in Merauke Regency. The study began in June-July 2021 and was carried out for two weeks. The research duration implemented in two weeks is divided into two days to conduct permits and approaches to village heads, religious leaders, and community leaders accompanied by community leaders.

Then one day was for introductions and asking for data on the number of mothers who have toddlers from health workers. Then eight days were conducted for research using the interview method, and the last day was to say goodbye to health workers, village heads, community leaders, and religious leaders.

The population and sample in this research were all mothers who had toddlers with a total of 57 populations and 57 samples by using the total sampling technique. The data collected in this study were primary and secondary. Primary data were obtained from an interview with respondents, and secondary data was obtained from the Merauke District Healthcare Office. The data analysis used univariate and bivariate analysis with a phi-correlation test. In addition, this study used a questionnaire that has been tested for validity and reliability testing. The validity and Reliability Test was conducted on 30 mothers with toddlers in the Jagebob 7 on the variables of knowledge (5 questions), attitude (5 questions), culture (3 questions), access to health services (3 questions), availability of health services (3 questions), the role of the family or husband (9 questions but 1 question was invalid, so it was deleted), the role of health workers (9 questions). The questions asked were regarding the knowledge possessed by the mother about childbirth, the postpartum period, and health services with the interpretation of less if the score is median and good if median. Likewise, other variables are divided into two categories with a cut of points using the median in its interpretation. This study was approved by the Health Research Ethics Commission, Faculty of Public Health, Universitas Jember under decree No. 176/KEPK/FKM-UNEJ/III/2021.

RESULTS

Based on Table 1 most of mothers has good knowledge with total number 31 respondents (54.4 %), mothers' attitudes towards safe delivery most of the respondents had a poor attitude those were as many as 42 respondents (73.7 %), the influence of culture shows that almost all respondents choose that culture affected as many as 53 respondents (93.0 %), access to health services shows that almost all respondents are difficult to access to services as many as 53 respondents (93.0 %), the availability of health services shows that more than half of the respondents feel the availability of health services, namely as many as 41 respondents (71.9 %). The community supports that as many as 55 respondents (96.5 %) the role of religious leaders shows that more than half of the respondents felt that the role of religious leaders was supportive, and as many as 32 respondents (56.1 %), the role of husband or family showed that more than half of the respondents felt that the role of husband or family was less supportive, as many as 32 respondents (56.1 %), health shows that more than half of the respondents feel the role of health workers, as many as 38 respondents (66.7 %).

Table 1

Univariate Analysis

Variable	n	%
Knowledge		
Poor	26	45.6
Good	31	54.4
Attitude		
Poor	42	73.7
Good	15	26.3
Culture		
Affected	53	93.0
Not affected	4	7.0
Access to the Health Services		
Unreachable	53	93.0
Reachable	4	7.0
Availability of the Health Services		
Not Available	16	28.1
Available	41	71.9
Role of Community Figures		
Not supportive	2	3.5
Supportive	55	96.5
Role of Religious Figures		
Not Supportive	25	43.9
Supportive	32	56.1
Role of Husband or Family		
Not Supportive	32	56.1
Supportive	25	43.9
Role of Health Workers		
Not Helpful	19	33.3
Helpful	38	66.7
Exclusion		
Do	21	36.8
Not Do	36	63.2
Total	570	100

Based on Table 2 the results of the bivariate test on 9 variables, 4 variables correlate with the alienation of women giving birth in the forest: mother's knowledge about safe delivery (p-value = 0.026), mother's attitude about safe delivery (p-value = 0.028), the role of religious leaders (p-value = 0.036), and the role of husband or family (p-value = 0.020). Meanwhile, cultural variables (p-value = 0.572), the availability of health services (p-value = 0.949), access to health services (p-value = 0.113), the role of community leaders (p-value = 0.059), and health workers (p-value = 1.000) have no relationship with the exclusion of women giving birth in the forest.

Table 2

Factors Associated With Exclusion of Women Giving Birth in the Forest

Variable	Exclusion						p-value	Contingency Coefficient
	Do		Not Do		Total			
	n	%	n	%	n	%		
Mothers'Knowledge							0.026	0.283
Poor	14	51.9	13	48.1	27	100		
Good	7	23.3	23	76.7	30	100		
Mothers' Behavior							0.028	0.280
Poor	19	45.2	23	54.8	42	100		
Good	2	13.3	13	86.7	15	100		
Culture							0.572	0.075
Affected	19	35.8	34	64.2	53	100		
Not Affected	2	50.0	2	50.0	4	100		
Access to the Health Services							0.113	0.205
Unreachable	21	39.6	32	60.4	53	100		
Reachable	0	0.0	4	100.0	4	100		
Availability of the Health Services							0.949	0.009
Not Available	6	37.5	10	62.5	16	100		
Available	15	36.6	26	63.4	41	100		
Role of Community Figures							0.059	0.242
Not Supportive	2	100	0	0.0	2	100		
Supportive	19	30.8	36	65.5	55	100		
Role of Religious Figures							0.036	0.268
Not Supportive	13	52.0	12	48.0	25	100		
Supportive	8	25.0	24	75.0	32	100		
Role of Husband or Family							0.020	0.295
Not Supportive	16	50.0	16	50.0	32	100		
Supportive	5	20.0	20	80.0	25	100		
Role of Health Workers							1.000	0.0001
Not Helpful	7	36.8	12	63.2	19	100		
Helpful	14	36.8	24	63.2	38	100		

DISCUSSION

The correlation between mothers' knowledge about safe delivery and the seclusion behavior of women giving birth in the forest with weak relationship strength. The direction of the relationship is unidirectional, which means that the higher the mother's knowledge, the higher the mother's awareness of not doing seclusion in the forest when giving birth. Respondents in this study had less knowledge about safe delivery. This also caused mothers to go into seclusion in the forest when giving birth. This

study is in line with research conducted that there is a relationship between knowledge, where the higher the knowledge, the higher the impact on the utilization of delivery facilities (14-17).

The correlation between mothers' attitudes about safe delivery and the exile behavior of women giving birth in the forest with weak relationship strength. The direction of the relationship is unidirectional, which means that the higher the mother's attitude about safe delivery, the higher the mother's awareness of not doing seclusion in the forest when giving birth. Some of the respondents in this study lack attitudes about safe childbirth, accompanied by high behavior in seclusion in the forest. This shows that the attitude has less impact on the behavior of the respondents to conduct seclusion in the forest during childbirth. The relationship between the role of religious leaders and the exile behavior of women giving birth in the forest with weak relationship strength. The direction of the relationship is unidirectional, which means that the higher the role of religious leaders, the higher the mothers' awareness not to do seclusion in the forest when giving birth. The study respondents felt that the role of religious leaders was very supportive and did not carry out high isolation behavior either. The research showed that this is the impact of the role of community leaders who play an active and real role in the choice of place of delivery for mothers (18).

The relationship between the role of the husband or family with the exile behaviour of women giving birth in the forest with weak relationship strength. The direction of the relationship is unidirectional, which means that the higher the role of the husband or family, the higher the mother's awareness not to seclusion in the forest when giving birth. Respondents in this study felt that the role of their husband or family was less supportive, accompanied by high exile behaviour. This is the impact of the role of the husband or family being less supportive in providing information, motivational, instrumental, and emotional support (19). This study is in line with research conducted, which shows a significant relationship between family support, where the higher the family support, the higher the impact on the utilization of delivery facilities (20-23).

This research shows that there is no correlation between culture, access to health services, availability of health services, or the role of community leaders and health workers with the exile behaviour of women giving birth in the forest. In this study, most respondents have difficult access to health services. This is caused by long distances and difficult road conditions, especially in the rainy season so it requires special transportation, namely a jeep, and it requires a fairly large cost to reach health services which has an impact on respondents to go into exile in the forest when giving birth.

In addition, most respondents in this study felt that health services were unavailable. Due to long distances and the difficulty of transportation to health services make respondents feel that health services are unavailable. Hence, it impacts respondents to practice seclusion in the forest when giving birth. The role of health workers is very important and does not carry out high isolation behaviour either (24-26). This is the impact of the role of health workers who play an active and real role in the selection of maternal delivery places, such as health workers who can approach pregnant women well through existing activities such as making counselling for pregnant women, holding classes for pregnant women, conducting surveys to every home to find out what is happening. Registering pregnant women and conducting community participation in maternal and child health. On the role of community leaders, respondents in this study felt that the part of community leaders was very supportive and did not carry out high isolation behaviour. This is the impact of the role of community leaders who play an active and real role in the choice of place of delivery for mothers (27-29).

CONCLUSION

This study found a correlation between variables of mothers' knowledge about safe delivery, their attitude about the safe delivery, the role of religious leaders, and the role of husband or family with the exile behaviour of women giving birth in the forest. The exile behaviour of women giving birth in the forest can be changed by increasing the knowledge and attitudes of the

husband or family mother and religious leaders. And no correlation between cultural variables, the availability of health services, access to health services, the role of community leaders, and the role of workers with the exclusion of women giving birth in the forest. This research suggests that healthcare facilities in Indonesia are evenly distributed, especially in every village in Merauke Regency, Papua.

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Milieu therapy based on local virtue influence on community acceptance on post restriction mental disorder patients at home

Terapia del entorno basada en la influencia de la virtud local en la aceptación de la comunidad en pacientes con trastornos mentales posteriores a la restricción en el hogar

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SUMMARY

Introduction: *Rehabilitation post restriction conditions is for patients who need excellent help. Environmental therapy is one of the modalities of nursing therapy that is useful for creating a conducive environment. This study aimed to analyze the effect of local-based therapy on receiving community to patients about post-restriction safety issues at home.*
Methods: *This research was an experimental study with the design of one group pre-test and post-test. The number of research samples was 15 people taken by purposive sampling. The initial step of the study was to conduct a Focus Group Discussion (FGD) on local virtue that helped develop guidelines for therapy. The research instruments were interviews and observations. Local-based treatment based on therapy was given for one month. The assessment data was the inferential analysis of paired t-test with an alpha of 0.05. The implementation of the study pays attention to ethical code research.*
Results: *The research results were obtained from the local people who apply milieu therapy to restrict life protection patients at home, namely the home environment arrangement and planting plant activities. Local virtue is influenced by community acceptance of patients' home posts restriction mental disorder (p-value<0.035).*
Conclusion: *Milieu therapy based on local virtue has a huge potential impact on improving the community's acceptance at home for mental health issues. Keep improving milieu therapy activities as a modality of mental nursing therapy for patients in a public health center.*

Keywords: *Community acceptance, local virtue, mental disorders, milieu therapy, post restriction.*

RESUMEN

Introducción: *La rehabilitación post condiciones de restricción es para pacientes que necesitan ayuda de excelencia. La terapia ambiental es una de las modalidades de la terapia de enfermería que es útil para crear un entorno propicio. Este estudio tuvo como objetivo analizar el efecto de la terapia local en la recepción de la comunidad a los pacientes sobre cuestiones de seguridad en el hogar posteriores a la restricción.*
Métodos: *Esta investigación fue un estudio experimental con el diseño de un grupo pre-test y*

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post-test. El número de muestras de investigación fue de 15 personas tomadas por muestreo intencional. El paso inicial del estudio fue realizar una discusión de grupo focal (FGD) sobre la virtud local que ayudó a desarrollar pautas para la terapia. Los instrumentos de investigación fueron las entrevistas y las observaciones. El tratamiento local basado en la terapia se administró durante un mes. Los datos de evaluación fueron el análisis inferencial de la prueba t pareada con un alfa de 0,05. La implementación del estudio presta atención a la investigación del código ético.

Resultados: *Los resultados de la investigación se obtuvieron de la población local que aplica la terapia ambiental para restringir la protección de la vida de los pacientes en el hogar, es decir, el arreglo del entorno del hogar y las actividades de plantación de plantas. Hay una influencia de la virtud local basada en la aceptación de la comunidad del trastorno mental de restricción de puestos en el hogar de los pacientes (valor de p<0,035).*

Conclusión: *La terapia del medio basada en la virtud local tiene un gran impacto potencial para mejorar la aceptación de la comunidad en el hogar para el problema de la salud mental. Seguir mejorando las actividades de milieu therapy como modalidad de terapia de enfermería mental para pacientes en un centro de salud público.*

Palabras clave: *Aceptación comunitaria, virtud local, trastornos mentales, terapia del medio, posrestricción.*

INTRODUCTION

A mental disorder is a syndrome or psychological pattern that clinically occurs in a person associated with distress, disability, and an increased risk of painful death and loss of freedom (1-3). The World Health Organization (WHO) estimated that people with mental disorders would reach 450 million worldwide in 2017. Based on data from the 2018 Basic Health Research, cases of mental disorders in Indonesia have also increased (4). This increase can be seen in the prevalence of households with people with mental disorders. There is an increase to 7 per mile of households, meaning that per 1 000 households, there are seven houses with mental illness, so the number is estimated to be around 450 thousand severe mental illnes in Indonesia (5) the distribution of tasks among health workers to address health workforce shortage, has been widely used to tackle mental health treatment gaps. However, its implementation in Indonesia has still been rarely explored. This study aimed to explore stakeholders' perspectives on the implementation of mental health task-shifting to nurses in Indonesia's primary health care. Methods: An exploratory descriptive approach using in-depth interviews and FOCUS group discussions (FGDs). Nevertheless, the data shows that the proportion of households with families with mental disorders who have been shackled had decreased from 14.3 % in 2013 to 14.0 % in 2018. Although the decline is only small, this shows positive developments regarding handling severe mental disorders in Indonesia (6).

In individuals with severe mental disorders, restraint and seclusion are often carried out in mental hospitals. Meanwhile, patients with mental disorders in the community will be restrained and isolated, known as confinement (6-8). In addition, the attitude of the family and society that still considers it a family disgrace if one of their family members has schizophrenia often makes people with schizophrenia hidden, ostracized, and even shackled (6,9,10).

Patients who have been released from shackles will, experience very different activities from when they were in shackles. After the physical shackles have been released, the pacient will be free to move and carry out physical activities freely. The patient's environment, including family and community, must be carefully prepared to support the patient's mental health (11,12). Family is where individuals start an interpersonal relationship, and family can influence patients' values, beliefs, attitudes, and behavior. The family has basic functions such as giving love, security, belonging, and preparing for the individual's adult role in society. If the family is seen as a system, then mental disorders in one family member will disrupt all systems or family circumstances (13).

Creating a conducive environment for patients, family, and the surrounding community is necessary. Milieu therapy is one of the modalities of mental nursing therapy that is very useful in creating a conducive environment. Not only the physical environment but also the social environment in the form of the participation of the family and the surrounding community. The arrangement of the physical environment

includes the arrangement of space, the provision of facilities and infrastructure according to the growth and development of the patient, and the selection of colors, and decorations. Structuring the social environment involves family, relatives, and the surrounding community. Family involvement is the essential aspect because the family is the main key to the development and progress of the patient. According to Friedman et al., in 2010, families are obliged to provide for basic needs and optimize peace of mind for patients (14). Mental disorders require a long period of therapy, so understanding and family cooperation are crucial in treatment. Family support is an important support system given by the family to prevent mental disorders in dealing with family burdens (15). This study aimed to analyze the effect of Milieu therapy based on local virtue on community acceptance of post-shackled mental disorder patients at home.

METHODS

This study used a quasi-experimental design with a one-group pre-posttest design. The research sample was taken from 15 people with mental disorders by purposive sampling on respondents who had met the inclusion criteria, such as 1) Age above 17 years old; 2) Staying at home with family; 3) The shackle has been removed; 4) Not experiencing dementia and violent behavior; 5) Not suffering from atrophy due to shackle, chronic and terminal illnesses; 6) Willing to be a respondent. The study was conducted in the Bantur Health Center, Malang Regency working area, in September-October 2019. The initial step of the research was to perform a Focus Group Discussion (FGD) on local wisdom, followed by compiling a therapeutic mileage guide. The research instrument used interviews and observations. Then, Milieu treatment based on local understanding was conducted for one month. The Milieu therapy provided was physical and social environment arrangements designed based on local wisdom.

Physical environment arrangement was spatial planning, infrastructure, and room painting according to the patient's needs which the patient and family carried out; planting plants in pots/volley bags around the house and maintaining the plants. The plants adapted to local wisdom were vegetables, which the local agriculture office assisted the seeds. However, the social environment included maintaining good relations and support for the family, neighbors, and surrounding communities. Data were analyzed with the SPSS 13.0 program using an inferential t-paired test with an alpha of 0.05. The research has passed the research ethics review from KEPK Poltekkes Kemenkes Malang with Ethical Approval Reg. No. 469/ KEPK-POLKESMA/2019 in 2019.

RESULTS

Characteristics of Research Respondents

Based on Table 1, it is shown that most of the patients were female with a total number of 9 respondents (60 %), the aged of 30 – 39 years and 40-49 years are equal with a total number of 3 of each frequency (13.3 %) but most patients are age 60-69 years with total 8 respondents (53.3 %) and graduated from elementary school (53.3 %). Most of the respondents' family informants with post-shackle mental disorders were female (60 %) aged 60-69 years (53.3 %), elementary school graduates (53.3 %) who worked as farm laborers (80 %) and were the respondents' biological mothers (40 %).

Based on Table 2, it is shown that most of the ages with first-level mental disorders were 10-19 years (60.0 %). Most of the time, they suffered from mental disorders between 10-19 years (46.7 %), and the time in shackles was two years (33.3 %). After removing the shackle, all patients could take care of themselves (eat, drink, bathe, brush their teeth, wash their hair) so that the patient's appearance was relatively adequate About 15 respondents (100 %), only some were productive: looking for grass (20.0 %) and working in the fields (33.3 %) but most of the patients post shackle are not working (46.7)

Focus Group Discussion (FGD)

The results of the FGD showed that some people thought that spiritual things caused the mental disorder. Patients became angry, talking to themselves, smiling, disturbing the environment, and looking less clean. The family has made every effort, including taking them to "smart people"

Table 1

Frequency Distribution of Research Respondents

Characteristic	Frequency	%
Patient with Mental Disorder (Shackle)		
Sex		
Male	6	40.0
Female	9	60.0
Age		
20-29 years	3	20.0
30-39 years	4	26.7
40-49 years	5	33.3
50-59 years	1	6.67
60-69 years	2	13.3
Education		
Uneducated	4	26.7
Elementary school	11	73.3
Family		
Sex		
Male	6	40.0
Female	9	60.0
Age		
30-39 years	2	13.3
40-49 years	2	13.3
50-59 years	3	20.0
60-69 years	8	53.3
Education		
Not Attend School	7	46.7
Elementary school	8	53.3
Occupation		
Farmer	2	13.3
Farm Labor	12	80.0
Driver	1	6.7
Family relationship		
Mother	6	40.0
Father	2	13.3
Children	1	6.7
Sibling	4	26.6
Wife	1	6.7
Aunt	1	6.7
Total	15	100

Table 2

Information on Mental Health History of Respondents with Mental Disorders Post Shackled

Characteristic	Frequency	%
Age of first mental disorder		
<10 years	1	6.7
10-19 years	9	60.0
20-29 years	3	20.0
30-39 years	0	0
40-49 years	2	13.3
Length of time of suffering from mental disorders		
<10 years	2	13.3
10-19 years	7	46.7
20-29 years	3	20.0
30-39 years	3	20.0
Length of time of being shackle		
1 year	1	6.7
2 years	5	33.3
4 years	1	6.7
10 years	3	20.0
11 years	2	13.3
13 years	1	6.7
14 years	2	13.3
Ability after release shackle		
Self-care	15	100
Help to do homework	0	0.0
Productive	0	0.0
Type of productivity/work		
Look for grass	3	20.0
Work in the fields	5	33.3
Unemployment	7	46.7
Total	15	100

(shamans/other than health workers) according to family beliefs and to medical treatment (mental hospitals). However, the results obtained were considered less than optimal, so shackles appeared by the patient's family. The shackle problem occurred because the family was desperate with the patient's condition, which has been treated many times and has not recovered, and the costs have run out. Yet, the patient was still angry, disturbing the environment, destroying goods/houses, and wandering around, afraid of being lost.

The existence of the movement to release shackles for patients with mental disorders has a positive impact on patients and their families. The problems experienced by patients with mental disorders after being released from shackles were as follows: mental health conditions

have improved, and they are no longer angry and disturbing the environment. Families and communities around patients with mental disorders after being released from shackles are responsible for assisting and controlling the patient's condition. The family accepted the patient well, was involved in daily activities according to their ability and need and motivated them to take medication or regular control so that it did not recur.

Influence of Milieu Local Wisdom-Based Therapy on Public Acceptance of Post-Shackled Mental Disorder Patients

Table 3 shows that most of the public acceptance before milieu therapy was good (66.7 %), and after milieu therapy, there was an increase in the number to be good (86.7 %). The results of the inferential analysis with the t-paired test obtained a p-value = 0.035, which means that milieu therapy based on local wisdom influences community acceptance of post-shackled mental disorder patients at home. The results of interviews with patients support this during the study. The results of interviews with patients (respondents) found that, on average, they said they did not feel isolated, the community did not forbid patients to participate in community activities, and some even worked like other people who had never had a mental disorder. Patients also feel happy, and some are even highly happy with the acceptance of the community for their presence in the community.

Table 3

Public Acceptance of Post Shackled Mental Disorder Patients at Home

Public Acceptance	Pre-Test		Post-Test		p-value
	N	%	n	%	0.035
Good	10	66.7	13	86.7	
Average	5	33.3	1	6.7	
Poor	0	0	1	6.7	
Extremely poor	0	00	0	0	
Total	15	100	15	100	

DISCUSSION

A mental disorder is a syndrome of a person's behavior patterns typically associated with a symptom of distress or impairment in one or more important human functions, namely psychological, behavioral, and biological functions. The disorder does not only lie within the human body. The relationship between the person but also with society (16). The existence of an interference with the community causes clients with mental disorders to be less accepted by the community. The lack of public acceptance of mental disorders often creates a stigma for patients and their families. Stigma is a person's characteristic that is perceived negatively by several other individuals. Stigma is a sign of disgrace that is formed on the part of a person (17). People who are labeled for their illness look like a stereotyped group. Negative attitudes create presumptions that form negative actions and discrimination.

The results showed an effect of milieu therapy based on local virtue on community acceptance of post-shackled mental disorder patients at home. Local virtue is very much needed in applying milieu therapy activities for patients with mental disorders to fit the local culture. Local virtue, often called local virtue, can be understood as a human effort to use reason (cognition) to act and behave towards something, object, or event in a certain space (18). This is in line with the theory that a therapeutic environment can encourage the healing process to occur (19). The environment must have characteristics such as the patient feeling happy/comfortable and not afraid of the environment, respecting the patient as an individual with rights, needs, and opinions and accepting patient behaviors in response to stress, reducing restrictions or prohibitions, and providing opportunities for patients. To make choices and form new behaviors. So, the patient feels familiar with the environment, feels happy, comfortable, and safe, and does not feel afraid of both psychological and physical threats (1).

Through this milieu therapy activity, it is hoped that it will positively impact patients, families, and communities. According to the Law of the Republic of Indonesia Number 18 of 2014 concerning Mental Health, it is stated

that mental health is a condition in which an individual can develop physically, mentally, spiritually, and socially so that the individual is aware of his abilities. As a result, they can cope with pressure, work productively, and contribute to their community (20). Another impact is the reduction in the negative stigma of society toward patients. With the evidence of the results of this study which shows an increase in public acceptance of patients, it will be able to reduce little by little the stigma of society on patients with mental disorders.

CONCLUSION

There is an influence of Milieu therapy based on local virtue on community acceptance of post-shackled mental disorder patients at home. The family has an essential role in providing support for applying Milieu therapy to patients with mental disorders post-shackled at home by maintaining the home environment and planting activities. Patients need to be involved in every activity to increase community acceptance.

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Perceived constraints and impacts of online learning experiences by Indonesian university students during COVID-19

Restricciones e impactos percibidos de las experiencias de aprendizaje en línea de los estudiantes universitarios de Indonesia durante el COVID-19

Devia Putri Lenggogeni[1a]*, Hema Malini[2a], Dewi Eka Putri[3a], Bunga Permata Wenny[4a]

SUMMARY

Introduction: *Many educational institutions introduced online learning during COVID-19 to cope with the social distancing and lockdown policies. The students face challenges in adapting to new circumstances and the unprecedented use of technology. This study aimed to identify the constraints and impacts experienced by students during online learning.*
Methods: *This study used a cross-sectional design approach for 407 students who participated in online learning. Sampling used a non-probability technique, namely the snowball sampling technique. The constraints and impacts of online learning were measured using a questionnaire. The statistical test used the Pearson correlation test.*
Results: *The results indicated a strong correlation between constraints and the impacts of online learning (p-value = 0.0001). Furthermore, a correlation test of constraints and each domain of online learning impacts was carried out. The statistical test results showed a correlation between constraints and impact caused by online learning, including with psychological (p-value = 0.0001, r = 0.67), physical (p-value = 0.0001, r = 0.51) and social (p-value = 0.0001, r = 0.62).*
Conclusion: *Despite the constraints of online learning, it has helped students continue their education. Moreover, identifying constraints is essential in ensuring there is the utilization of various strategies that will help in the optimization of online learning and reduce its impacts of it.*

Keywords*: Constraints online learning, COVID-19, impacts online learning,*

RESUMEN

Introducción: *Muchas instituciones educativas introdujeron el aprendizaje en línea durante el COVID-19 para hacer frente a las políticas de distanciamiento social y confinamiento. Los estudiantes enfrentan desafíos para adaptarse a las nuevas circunstancias y al uso sin precedentes de la tecnología. Este estudio tuvo como objetivo identificar las limitaciones y los impactos experimentados por los estudiantes durante el aprendizaje en línea.*
Métodos: *Este estudio utilizó un enfoque de diseño transversal para 407 estudiantes que participaron en el aprendizaje en línea. El muestreo utilizó una técnica no probabilística, a saber, la técnica de muestreo*

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de bola de nieve. Las limitaciones y los impactos del aprendizaje en línea se midieron mediante un cuestionario. La prueba estadística utilizó la prueba de correlación de Pearson.

Resultados: *Los resultados indicaron una fuerte correlación entre las limitaciones y los impactos del aprendizaje en línea (valor p = 0,0001). Además, se llevó a cabo una prueba de correlación de las limitaciones y cada dominio de los impactos del aprendizaje en línea. Los resultados de las pruebas estadísticas mostraron una correlación entre las limitaciones y el impacto causado por el aprendizaje en línea, incluido el psicológico (valor de p = 0,0001, r = 0,67), físico (valor de p = 0,0001, r = 0,51) y social (valor de p = 0,0001, r = 0,62).*

Conclusión*: A pesar de las limitaciones del aprendizaje en línea, ha ayudado a los estudiantes a continuar con su educación. Además, identificar las restricciones es esencial para garantizar que se utilicen diversas estrategias que ayudarán a optimizar el aprendizaje en línea y reducir sus impactos.*

Palabras clave: *Restricciones del aprendizaje en línea, COVID-19, Impactos del aprendizaje en línea.*

INTRODUCTION

Since it was declared a global pandemic, various countries have tried to suppress and reduce the spread of COVID-19. Due to suppress and reduce the transmission of COVID-19, several countries have established infection prevention and control measures by limiting human contact (1-3). Lockdown is one of the government's efforts to restrict human contact to reduce the spread of COVID-19. The Indonesian government established a lockdown and social distancing policy during the COVID-19 pandemic. The existence of policies to reduce the spread of COVID-19 carried out by many countries has caused various changes in various aspects of life, such as the learning system. The policy resulted in conditions that the world of education must be able to adapt, through an online learning system (4,5).

COVID-19 has made various educational institutions switch from face-to-face to online learning (6-8). Online or distance learning is carried out separately between students and teachers and requires a particular delivery method (9,10). Online learning uses the internet and several other important technologies to develop materials to achieve educational goals, instructional delivery, and program management (11).

During the COVID-19 pandemic, many universities worldwide digitized the learning process to fulfill the necessity of urgent learning (6,12). As the result, online learning has been observed as a possible alternative to face-to-face learning. Based on the meta-analysis conducted by Cook (2009) (13), it has been noted that online learning is effective and similar to the conventional learning method. Furthermore, according to the assessment of students' performance and the knowledge gained through online learning, it can be concluded that this method is equivalent to face-to-face learning (14).

Online learning is one of several features of the digital transformation of education institutions. Online learning is an educational use of technological devices, equipment, and the internet (15). Utilizing the internet and several other important technologies to develop materials for educational purposes, instructional delivery, and program management (11). Although online learning relies on technological devices and the internet, teachers, and students with poor internet connections can hinder online learning. The dependence of online learning on technological tools and the provision of such tools is a major challenge for institutions, faculty, and students.

Online learning results from carefully designed instructional planning have been investigated for decades (16). However, for online learning to be effectively operational, it requires adopting content, methodology, pedagogy, and technology (17). Nowadays, about 61.9 % of students worldwide have felt the impact of higher learning institutions' closure by local governments due to the COVID-19 pandemic (18). This shows the unpreparedness exhibited by most learning institutions towards adjusting their teaching methods in case of emergencies (19).

Major and dramatic changes in learning occurred during the COVID-19 pandemic, resulting in some learning being disoriented. Students have lost the way of learning that they used before. Furthermore, the students are also faced with challenges in adapting to new circumstances, the unprecedented use

of technology in learning (20), the necessity for independent learning, and the lack of a learning structure (19). The continuing spread of COVID-19 and the closure of educational institutions in various countries have significantly impacted the students' education, social life, and mental health (21).

Online learning is still being carried out in Indonesia today. Even though the public university is usually located in the capital city, students come from various regions with different economic backgrounds and regional conditions, affecting access to online learning. Various studies have shown online learning to have an impact on students. Many studies have explored the impacts of online learning on students' psychology. However, this study identified the impacts caused by online learning, not only the psychological impact. Furthermore, this study explores how constraints impact students' participation in online learning. This study also aimed to investigate the correlation between constraints and the psychological, physical, and social impacts of online learning on students.

METHODS

Study Design and Samples

This study used quantitative research with a cross-sectional design. This study used a survey questionnaire and hypotheses to explain the relationship between the constraints and impacts of online learning. The sample was taken from one public university student aged between 18 to 24 years using a non-probability technique with snowball sampling. The number of samples in this study was 407 respondents who conducted online learning for at least one semester. Data collection was carried out in July-August 2021 using a questionnaire through an online survey. The method used questionnaires containing students' demographic data, constraints, and impacts of online learning.

Variables

The independent variable was the constraints of online learning, while the dependent variable was the impacts of online learning during the pandemic COVID-19 measured by questionnaire. The students who meet the inclusion criteria and fulfilled informed consent will be selected and followed in this study.

Instrument and Data Analysis

The questionnaire was adopted from studies by Haider and Al-Salman (2020) (22) Jordanian universities switched to the online learning model as an alternative to traditional face-to-face education. The researchers designed a questionnaire that consists of two main sections; the first section included demographic information including gender, level/year, age, and cumulative average (GPA and Elmer et al. (2020) (23). Furthermore, it was modified that the validity and reliability tests were carried out. The questionnaire consisted of 16 questions including psychological, physical, and social impacts. The validity test results for each question on the impact questionnaire were regarded as valid, where each had a value of results > r-table (0.273). The Cronbach's alpha value was 0.922, making the reliability test result declared reliable. The answers to the questions always included often, sometimes, and never. The constraints students faced during online learning had 12 questions, which were answered using a Likert scale of 1-4. The validity test indicated that each question on the constraints questionnaire could be declared valid with a value of results > r-table (0.273). The reliability test results showed Cronbach's alpha value of 0.900, which increased its validity, and each question was rated with answers: always, often, sometimes, and never with the Likert scale of 1-4. The statistical test used Pearson correlation test.

Ethical Approval

Respondents who participated completed the informed consent form before completing the online questionnaire. The research permit was obtained from the Health Research Ethics Commission of Padang Hospital with 215/ KEPK/2021.

RESULTS

Most respondents were between 19 and 20 years old, representing 236 people (58 %). Furthermore, female participants were 333 people (81.8 %), while the remaining percentage was male. The other statistics involved 117 third-semester students (28.7 %) and the other 159 (39.1 %) with a GPA range of 3.51 - 37.5.

Table 1

Frequency Distribution of Impacts and Constraints on Online Learning

No	Statements	Always	Often	Sometimes	Never
Impact Of Online Learning					
Psychological Impact					
1	Online learning at home makes me uncomfortable	51 (12.5 %)	155 (38.1 %)	169 (41.5 %)	32 (7.9 %)
2	The online learning method that is currently being applied makes me experience a decrease in learning motivation	81 (19.9 %)	175 (43 %)	126 (31 %)	25 (6.1 %)
3	I feel confused following the online learning method as it is currently being used	65 (16 %)	163 (40 %)	144 (35.4 %)	35 (8.6 %)
4	I feel like I don't have time to rest during online learning	30 (7.4 %)	104 (24.6 %)	186 (45.7 %)	87 (21.4 %)
5	The use of electronic tools to support online learning makes me bored	123 (30.2 %)	169 (41.5 %)	93 (22.9 %)	22 (5.4 %)
6	I feel that online learning has limited the emotional support I should get from those closest to me, such as family and friends	48 (11.8 %)	145 (35.6 %)	147 (36.1 %)	67 (16.5 %)
7	The use of gadgets/ laptops/mobiles during online learning makes it easy for me to divert my attention to other things outside of learning	111 (27,3 %)	177 (43,5 %)	101 (24,8 %)	18 (4,4 %)
8	I feel bored with the online learning method used today	120 (29.5 %)	152 (37.3 %)	108 (26.5 %)	27 (6.6 %)
Social Impact					
1	During online learning, I find it difficult to relax	28 (6.9 %)	113 (27.8 %)	197 (48.4 %)	69 (17 %)
2	During online learning, I feel socially isolated	70 (17.2 %)	146 (35.9 %)	141 (34.6 %)	50 (12.3 %)
3	Online learning makes me feel isolated from friendship	73 (17.9 %)	135 (33.2 %)	143 (35.1 %)	56 (13.8 %)
4	Current online learning has limited my interaction with the environment	87 (21.4 %)	168 (41.3 %)	105 (25.8 %)	47 (11.5 %)
Physical Impact					
1	I feel tired of following the online learning used during the COVID-19 pandemic	92 (22.6 %)	156 (38.3 %)	130 (31.9 %)	29 (7.1 %)
2	Online learning complicates me to concentrate on following lessons	111 (27.3 %)	179 (44 %)	95 (23.3 %)	22 (6.4 %)

Continued on page S961…

…continuation Table 1.

No	Statements	Always	Often	Sometimes	Never
Impact Of Online Learning					
Psychological Impact					
3	I feel that online learning that is currently being carried out is not physically healthy because it makes me experience physical complaints (for example, headaches, sore eyes, and others)	132 (32.4 %)	155 (38.1 %)	94 (23.1 %)	26 (6.4 %)
4	Online learning has made me difficult to sleep	55 (13.5 %)	117 (28.7 %)	157 (38.6 %)	78 (19.2 %)
Learning Constraints					
1	I am having financial problems (fulfilling internet quota) in participating in online learning	103 (25.3 %)	127 (31.2 %)	116 (28.5 %)	61 (15 %)
2	I have problems with internet access in participating in online learning	70 (17.2 %)	144 (35.4 %)	145 (35.6 %)	48 (11.8 %)
3	Lack of opportunity to ask and discuss during online learning	44 (10.8 %)	125 (30.7 %)	186 (45.7 %)	52 (12.8 %)
4	There is communication that is not smooth during the learning process with online learning methods	57 (14 %)	192 (47.2 %)	140 (34.4 %)	18 (4.4 %)
5	Difficulty understanding the lessons given during online learning	81 (19.9 %)	196 (48.2 %)	140 (34.4 %)	18 (4.4 %)
6	Lack of study time due to assignments piling up during online learning	91 (22.4 %)	172 (42.3 %)	108 (26.5 %)	36 (8.8 %)
7	I have problems with skills in using gadgets/laptops/mobiles that are used to support the online learning process	21 (5.2 %)	68 (16.7 %)	162 (39.8 %)	156 (38.3 %)
8	I have problems using online learning applications	13 (3.3 %)	56 (13.8 %)	182 (44.7 %)	156 (38.3 %)
9	I do not focus on participating in online learning	62 (15.2 %)	188 (46.2 %)	140 (34.4 %)	17 (14.2 %)
10	Environmental conditions interfere with me in doing online learning	62 (15.2 %)	134 (32.9 %)	164 (40.3 %)	47 (11.5 %)

Table 1 shows the impacts and constraints of online learning experienced by students during the COVID-19 pandemic. 169 respondents claimed that online learning at home makes them uncomfortable (41.5 %). The impacts of online learning consist of psychological, social, and physical impacts. It is known that 175 respondents (43 %) stated that they mainly experienced decreased motivation during online learning, and 163 respondents (40 %) claimed that they experienced a lack of concentration while performing online learning. Also, 152 respondents (37.35) reported that they mostly felt bored with the new learning methods, while 145 respondents (35.6 %) felt having limited emotional support. The social impact of online learning had also been reported by students, where 168 respondents (41.3 %) stated that online learning often limited student interaction socially with the surrounding environment and 146

respondents (35.9 %) reported experiencing social isolation during online learning. Furthermore, from the physical impact of online learning, it is known that 156 respondents (38.3 %) often felt tired from participating in online learning, 179 respondents (44 %) often had difficulty concentrating in following lessons, and 155 respondents (38.1 %) stated that online learning was currently being carried out usually caused physical complaints like headaches, sore eyes, etc.

Meanwhile, online learning obstacles that students often experienced included problems with internet access in participating in online learning, which was reported by 144 respondents (35.4 %), 192 respondents (47.2 %) complained of poor communication during the learning process, 196 respondents (48.2 %) complained on the difficulty to understand the lessons given during online learning and 188 respondents (46.2 %) did not focus on participating online learning.

Table 2

Frequency Distribution of Constraints and Impacts on Online Learning

Variable	Min- Max	Mean	SD	95 % CI
Impact of Online Learning	16 - 64	37.5	9.6	36.56 - 38.44
Impact of Psychological Learning	8 - 32	18.63	4.9	18.15 - 9.11
Impact of Physical Learning	4 - 16	9.9	10	9.61 - 10.18
Impact of Social Learning	4 - 16	8.97	2.7	8.71 - 9.24
Constraints of Online Learning	11 - 40	25.1	5.3	24.57 - 25.61

Table 2 shows the frequency distribution of the constraints and impacts experienced by students during online learning. The mean value for learning impact is 37.5 (SD = 9.6), with a minimum and maximum weight of 16-64. Meanwhile, the mean value for online learning constraints is 25.1 (SD = 5.3), with a minimum and maximum value of 11-40.

Table 3

Analysis of Correlation Tests between Constraints and Impacts on Online Learning

	Total Impact	Psychological Learning	Physical Learning Impact	Social Learning Impact	Learning Obstacles Impact
Total Impact	1				
Impact of Psychological Learning	0.954	1			
Impact of Physical Learning	0.842	0.683	1		
Impact of Social Learning	0.915	0.840	0.673	1	
Learning Constraints	0.669	0.669	0.510	0.615	1

Note: All correlations were significant at $p < 0.05$

Table 3 shows the correlation test between constraints and the impacts of online learning. The relationship between the constraints and impact of online learning was examined using the Pearson correlation test. Based on the results of statistical tests, it is known that there was a correlation between the constraints and impacts of online learning with a p-value = 0.0001, and there is a strong positive correlation between the obstacles and impacts of online learning with r = 0.67. This means that the greater the learning constraints, the greater the impact of online

learning. Furthermore, the Pearson correlation test was carried out on the constraints with each domain of the impact of online learning. The statistical test results showed a correlation between the constraints and psychological impact of online learning (p-value = 0.0001, r = 0.67), the physical constraints and impacts of online learning (p-value = 0.0001, r = 0.51) and the constraints and social impacts of online learning (p-value = 0.0001, r = 0.62).

DISCUSSION

As a result of the COVID-19 pandemic, most institutions worldwide were forced to switch from conventional to online learning (9,10). The sudden change from face-to-face to online created a complex constraint for students accustomed to physical learning (24). The constraints caused by online learning have affected the performance of students. The results showed a correlation between limitations and the impact of online learning. Furthermore, the correlation test conducted on each domain regarding implications for online learning also shows significant psychological, social, and physical impacts on students who participated in online learning.

In this study, online learning constraints were associated with access to the internet, difficulty understanding material, poor communication, decreased focus during learning, and a lack of support for online learning. Moreover, it was found that 35.4 % of respondents often experienced problems with internet access while participating in online learning. Access to the internet is one of the problems most reported by students during learning. It is known that studies on online learning in developing countries have shown that online learning problems are concentrated on limited access to devices and the internet (25). Indonesia is one of the developing countries with internet connections that are not evenly distributed in various regions, and complaints about internet access are often reported in online learning.

In this study, the environment is also one of the problems in online learning. A total of 163 respondents (40.3 %) complained that the environment sometimes interfered with online learning. In several studies, students reported that their home was an environment that could interfere the online learning and was vulnerable to being disturbed by roommates or family members (26-28). In a study conducted by Realyvásquez-Vargas et al. (2020) (29), it was found that environmental factors contributed significantly to student academic achievement during online learning amid the COVID-19 pandemic situation.

Furthermore, 43.5 % of respondents mentioned that several technologies such as gadgets, laptops, and mobile phones often turn students' attention to other things outside of learning. In addition, the use of media such as gadgets and laptops make students experience a decrease in focus during online learning. Such problems are associated with difficulties in students' focus and concentration while studying (14,28). The difficulty of focusing during online learning was also reported to be one of the constraints in this study. It was known that 46.2 % of respondents often experienced a decrease in focus during online learning. The decreased focus during learning can be a barrier to gaining knowledge by participating in online learning (30). It can be seen in this study that as many as 196 respondents (48.2 %) often had difficulty understanding lessons during online learning, thereby becoming a constraint in optimizing the learning method.

This current study found that communication in online learning becomes a constraint during online learning. A total number of 47.2 % of respondents often complained of poor communication during the online learning process. The purpose of communication in online learning is the same as face-to-face learning, to form bonds and exchange information between lecturers and students. When lecturers communicate with students, either in face-to-face or online classes, they are communicating to provide knowledge or information so that the students gain understanding. However, communication was indicated as a constraint in distance learning, which should be addressed to exchange information between students and lecturers effectively (31).

Physical distancing was imposed to reduce the spread of the COVID-19 pandemic. However, it has exposed students to academic stress, leading

to mental illnesses among students (32,33). This research showed that students had been affected psychologically, physically, and socially. The results indicated about 41.5 % of respondents sometimes feel uncomfortable with online learning. According to respondents, online learning creates uncomfortable conditions, leading to high anxiety levels such as confusion and frustration (6). It also showed that 163 respondents (40 %) often felt confused following the online learning methods. Therefore, a good match between technological design and student psychology components is required in online learning. A lack of solid policies in the learning process can be a constraint in the education sector (6).

During online learning about 43 % of respondents often experienced decreased learning motivation. Research conducted by Tan in 2021 also showed that online learning during the COVID-19 pandemic made it difficult for students to concentrate and experienced a decrease in learning motivation (34). Several other studies stated that most students experienced a decrease in learning motivation during online learning. Harandi in 2015 showed a correlation between online learning and motivation. It is known that learning motivation is influenced by how the class takes place, whether physically or virtually (35).

Using electronic devices to support online learning for such a long time causes boredom. It can be seen that 41.5 % of respondents often experienced boredom while learning online. Boredom is considered an emotion that is perceived in the academic environment. According to Finkielsztein, in 2020 (36), 40 % to 59 % of students feel bored while online classes. Academic boredom is a condition related to an educational context (specifically during the classroom or learning-related activities), usually described as a transient psychophysiological response to a less meaningful educational situation (37,38).

The impact of learning from the social aspect can be seen in 35.9 % of respondents who felt socially isolated during online learning. This study also showed that 38.3 % of respondents reported that online learning that was currently being carried out had limited student interaction with the surrounding environment. Furthermore, students felt less connected with their lecturers and friends during online learning than during face-to-face learning. Boling et al., in 2012 observed that most students describe online learning as a unique teaching method with limited interaction (39). Previous research has highlighted the lack of social contact and feelings of isolation during lockdown (40-42). The previous study has highlighted the lack of social contact and feelings of isolation during lockdown (40-42). This showed that students would feel less connected to the academic community than when involved in classroom learning (28,40,41). Social theory strongly emphasizes the importance of peer interaction and the interaction between students and lecturers at learning centers (43). This finding confirmed the significance of social interactions and communication mechanisms necessary for an effective online learning system (44,45).

The impact of learning from the physical dimension was seen in as many as 38.3 % of respondents who felt tired of taking part in online learning during the COVID-19 pandemic. Moreover, 38.1 % of respondents complained that online learning is not carried out healthily, resulting in headaches, sore eyes, and others. It is known that online learning has caused health problems for students due to the many tasks that must be done and the use of laptops/computers or cell phones for a prolonged period.

CONCLUSION

This study provides an overview of the constraints and impacts of online learning. The constraints and impacts of online learning due to online learning itself must be a concern. Due to the uncertainty caused by the COVID-19 pandemic, it is essential to ensure the design of appropriate teaching methods that best fit the current situation. Conclusively, online learning has been excessively effective despite constraints brought about by the COVID-19 pandemic. During this pandemic, the education sector has heavily invested in technological advancement to avoid the changing academic schedule. This research has clearly outlined the correlation between constraints and impacts caused by online

learning. Therefore, there is a need to employ education strategies to overcome constraints and optimize online learning.

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Effect of Aloe vera gel on wound healing process for diabetic foot ulcers: A pilot study

Efecto del gel de Aloe vera en el proceso de cicatrización de las úlceras del pie diabético: un estudio piloto

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SUMMARY

Introduction: *Patients who experience diabetic foot ulcers (DFU) should have undertaken prompt wound care. Currently, the principles of wound care have shifted to the moist principles of a wide range of treatments, advanced technology, and complementary alternative therapy. This study aimed to investigate the effects of Aloe vera gel therapy as a complementary alternative therapy to promote wound healing of DFU.*
Methods: *This study used a quantitative with a prospective design. Eight patients in the intervention group and nine in the control group were allocated based on the consecutive sampling technique. The intervention group used aloe vera gel once every two days, while for the control group, wounds were treated every day using NaCl at 0.9 %. The wound healing progress was observed for three weeks.*
Results: *The results confirmed that the mean score of the Bates Jensen Score in the intervention group decreased, which indicates that the wound healing process was improved by using the Aloe vera gel by 13.38 % (p <0.001), which was higher than in the control group.*
Conclusion: *Aloe vera gel, as a complementary alternative therapy accelerates the wound healing process in DFU. Further research with larger sample size and conducted in various regions may be beneficial to improve the evidence.*

Keywords: *Aloe vera gel, complementary alternative therapy, diabetic foot ulcers, wound status continuum.*

RESUMEN

Introducción: *Los pacientes que experimentan úlceras de pie diabético (UPD) deben haber realizado un cuidado rápido de la herida. Actualmente, los principios del cuidado de heridas se han desplazado hacia los principios húmedos de una amplia gama de tratamientos, tecnología avanzada y terapia alternativa complementaria. Este estudio tuvo como objetivo investigar los efectos de la terapia con gel de Aloe vera como una terapia alternativa complementaria para promover la cicatrización de heridas de UPD.*
Métodos: *Este estudio utilizó un diseño cuantitativo con un diseño prospectivo. Se asignaron ocho pacientes en el grupo de intervención y nueve en el grupo de control según la técnica de muestreo consecutivo. El grupo de intervención usó gel de aloe vera una vez cada dos días, mientras que para el grupo de control, las heridas se trataron todos los días con NaCl al 0,9 %. El progreso de cicatrización de heridas se observó durante tres semanas.*
Resultados: *Los resultados confirmaron que la puntuación media del Bates Jensen Score en el grupo de intervención disminuyó, lo que indica que el proceso de*

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cicatrización de heridas mejoró con el uso del gel de Aloe vera en un 13,38 % (p < 0,001), que fue mayor que en el grupo de control.
Conclusión: *El gel de Aloe vera como terapia alternativa complementaria acelera el proceso de cicatrización de heridas en UPD. La investigación adicional con un tamaño de muestra más grande y realizada en varias regiones puede ser beneficiosa para mejorar la evidencia.*

Palabras clave: *Gel de Aloe vera, terapia alternativa complementaria, úlceras del pie diabético, continuidad del estado de la herida.*

INTRODUCTION

The International Diabetes Federation (IDF) 2021 estimated those 5.7 million adults living with diabetes had diabetes complications (1). In Indonesia, a study reported that 85.7 % of people with diabetes mellitus have a high risk of having Diabetic Foot Ulcers (DFU) (2,3). DFU was reported to be 12 % (4), and the infection rate was 35.7 % (5). Thus, optimal management for DFU patients includes adequate blood glucose control and wound care (6,7).

Various wound care modalities are available, including modern wound dressing, advanced therapy, and Complementary Alternative Therapy (CAT). In addition, CAT has been introduced in wound care from animal to human studies lauding natural medicine (8) and medicinal plants (9,10). A systematic review identified 12 plants that had a healing effect and among these plants is Aloe vera (9). Today, there has been an increasing concern that Aloe vera has an advantageous effect on wound healing (11,12). Previously, the use of honey has been proven to be better than conventional therapies in the healing process (13) as well as the use of herbal medicine, which shortened the healing time (14) and had beneficial effects on the wound (15-17). However, those studies mainly used animal subjects. Therefore, Aloe vera gel's clinical effect on human subjects remains questionable.

According to the CAT, Aloe vera has some healing effects in the Deoxyribose Nucleic Acid (DNA) repair process stage, with no significant cytotoxic and mutagenic reaction to the body (15,18). Aloe vera contains a high-water content and contains various active components such as fat- and water-soluble minerals, vitamins, simple/complex polysaccharides, organic acids, enzymes, and phenolic compounds. Aloe vera gel retains moisture and integrity of the skin and accelerates the wound healing process (19). Aloe vera gel consists of amino acids and many inorganic electrolytes like iron, potassium, magnesium, chromium, copper, sodium, calcium, and zinc, which are vital parts of the wound healing process (15). Aloe vera has biological activities because it contains chemical components such as astringent, hemostatic, antidiabetic, antiulcer, antibacterial, anti-inflammatory, antioxidant, and anticancer properties. It also effectively treats gastrointestinal disorders, radiation injury, wounds, and burns (20). Aloe vera has physical, chemical, and biological properties that benefit wound healing. However, there is currently limited information regarding its effect on wound healing, particularly in DFU. Thus, the current study aimed to evaluate the effectiveness of Aloe vera gel as a CAT on wound healing progress in patients with DFU.

METHODS

Study Design and Samples

This study was a quasi-experimental design. The subjects were patients in a city outpatient health center in Indonesia. Subjects of this study were selected consecutively with the inclusion criteria including patients with diabetic foot ulcers, diabetes type 2, the depth of the Bates-Jensen wound stage 2-4 (21), age of 26-59 years, and no smoking habit. Meanwhile, the exclusion criteria from the study constituted circumstances or other diseases that interfered with the measurement or interpretation, such as heart disease, malignancies, Human Immunodeficiency Virus (HIV), chronic kidney failure, and pulmonary Tuberculosis. Using purposive sampling, the number of samples in this study was 22, divided into two groups, and each group had 11 samples. However, during the intervention of this study, several respondents dropped out due to several reasons, and only 17 samples were analysed (Figure 1).

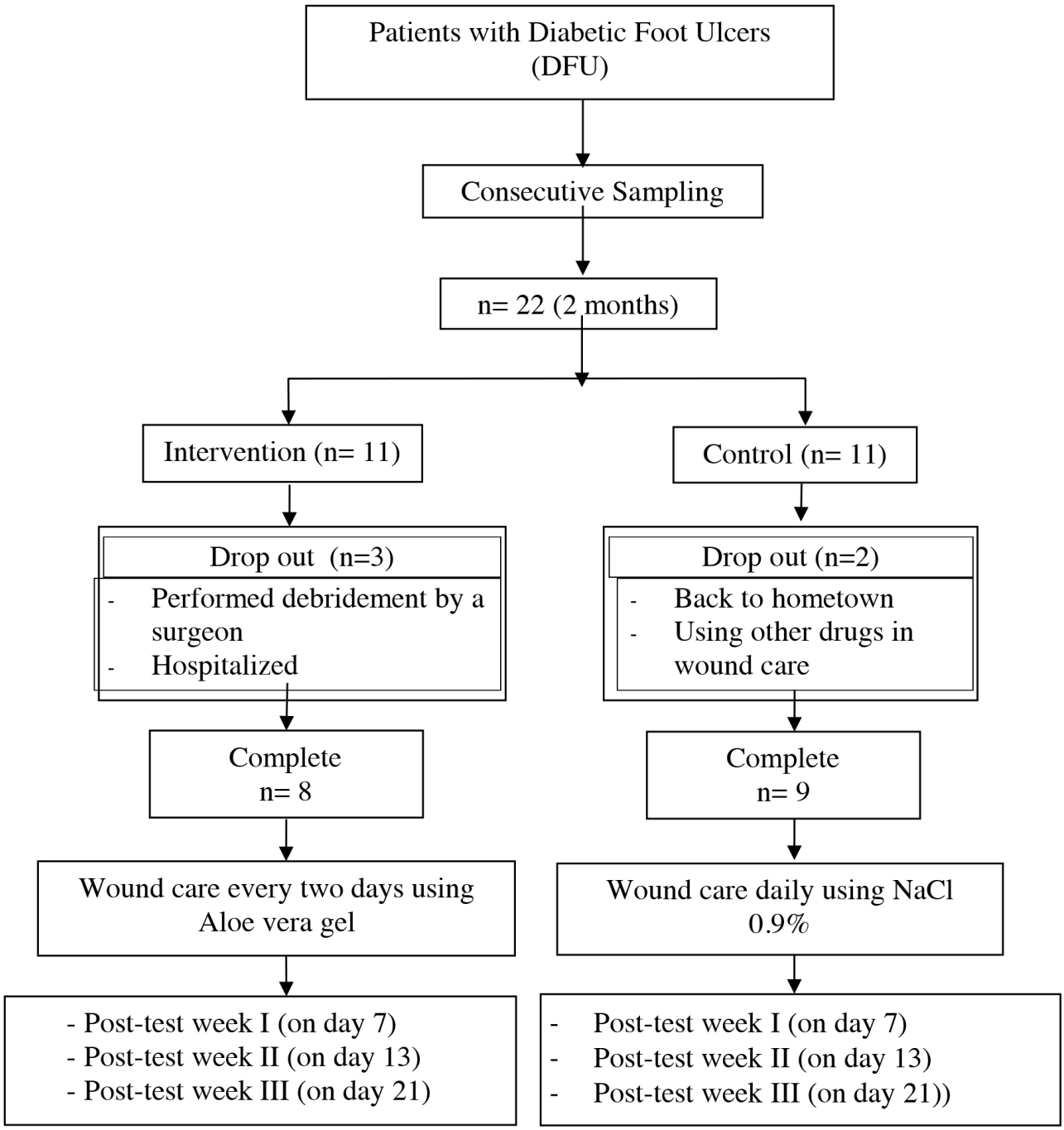

Figure 1. Consort Flowchart.

Variables and Intervention

The independent variable was Aloe vera gel (intervention group) and NaCl 0.9 % (control group), while the dependent variable was wound healing based on the Bates Jensen Wound Assessment (BJWAT) Scale (21). All participants were allocated into two groups through a consecutive sampling method, i.e., all individuals who met the selection criteria were selected until the desired number of samples was met. The Aloe vera treatment of wounds was performed once in two days for the intervention group, and the control group used standard treatment from the physician using normal saline (NaCl 0.9 %). In addition, both groups got wound care from certified home care nurses. The wound healing process uses the BJWAT, which has 13 subscales with a range of values 13-65 (21).

Instrument and Data Analysis

The instrument used in this study was the Bates Jensen Wound Assessment Scale (BJWAT), which has 13 subscales (21). Numeric data were presented in mean ± S.D., and ordinal or categorical data were reported in frequency (n). The Shapiro-Wilk test was performed to evaluate the normality of data, and homogeneity (Levene's) tests were completed before applying statistical Analyses. Repeated measures ANOVA test was used to evaluate the effect of Aloe vera gel on the wound healing process. The statistical process was conducted using statistical software.

Ethical Approval

The patients had also signed written informed consent. This study had been granted an ethical clearance from the Faculty of Medicine of Universitas Andalas review board for using CAT in performing wound care for DFU patients (IRB: 091/KEP/FK).

RESULTS

In total, there were 22 subjects initially assigned for this study for both groups. However, only eight subjects completed the treatment in the intervention groups and nine subjects in the control groups. Since a home care nurse conducted the intervention for this study, the researchers need to be granted permission from the physician and patients to continue their wound care using the Aloe vera gel. Some physicians did not approve of the patients using the Aloe vera gel. Thus, the researchers must adapt to continue the study by using a limited number of samples. The mean age of the intervention group was 53.25 ± 1 12 - 27 years old and 50.56 ± 41 – 53 years old for the control group. All subjects were non-smoking and had type 2 diabetes.

Table 1 showed that in the pre-test, week 1 and week 2 there was no significant difference between both groups for the 13 wound characteristics using the BJWAT. The difference between the two groups occurred in week 3 for necrotic tissue type, granulation, and epithelization. In general, between both groups, significant changes in eight components of the BWJAT were seen in the intervention group, while, in the control group, only four components showed significant changes. In the fourth measurement, there was a decrease in the average wound status continuum in the intervention group, as shown in the mean score of 45.63 to 42.88 in the first week, 38.00 in the second week, and 32.25 in the third week. Meanwhile, a drop in the mean value of the wound status continuum also occurred in the control group from 42.89 to 42.11 in the first week, 40.44 in the second week, and 39.67 in the third week. However, the intervention group had a more significant change than the control group because in wound care using 0.9 % NaCl changes only occurred in the amount of necrotic tissue, exudate, and granulation tissue.

Table 2 also showed the result of Repeated Measures ANOVA on all tests of Wound Continuum Status for both groups. The overall result shows that differences in all average test scores in all weeks were significant ($p < 0.05$). However, there were differences in their significance values. The intervention group had a highly significant difference ($p = 0.001$), whereas the control group obtained a lower significant p-value of 0.013. The test also showed the intervention group's significant value of $p < 0.05$. In addition, a significant difference ($p < 0.05$) was found between both group's pre-test scores for week 1 and week 3.

Table 1

The Wound Healing Process Based on BJWAT Scale in Both Groups

No	BJWAT	Pre-test			Week 1			Week 2			Week 3			p-value Friedman	
		C	I	p-value	C	I	p-value	C	I	p-value	C	I	p-value	C	I
1	Width (cm)	2	3	0.089	2	3		2	3	0.052	2	3	0.052	0.39	1
2	Depth (cm)	3	3	0.186	3	3	0.186	3	3	0.186	3	3	0.186	0.39	1
3	Edges	2	2.5	0.406	2	2.5	0.664	2	2	0.567	2	2	0.162	0.39	0.02
4	Undermining	1	1	0.719	1	1	0.719	1	1	0.396	1	1	0.396	0.39	0.39
5	Necrotic Tissue Amount	4	4	0.427	4	4	0.743	4	3	0.309	4	3	0.055	0.39	0
6	Necrotic Tissue Type	5	5	0.857	5	4	0.29	4	3	0.134	4	2	0.023*	0	0
7	Exudate Type	4	4.5	0.833	4	4	0.833	4	4	0.41	4	3	0.104	0.39	0
8	Exudate Amount	4	5	0.458	4	4	0.919	4	4	0.274	3	3	0.078	0.02	0
9	Skin Color Surrounding Wound	3	3	0.467	3	3	0.467	3	3	0.467	3	3	0.467	0.39	1
10	Peripheral Tissue Edema	3	2	0.404	3	2	0.404	3	2	0.437	3	1	0.224	0.39	0.06
11	Peripheral Tissue in duration	1	2.5	0.051	1	2	0.526	1	1	0.549	1	1	0.63	0.51	0
12	Granulation tissue	5	5	0.862	4	4	0.675	4	3	0.385	4	2.5	0.015*	0	0
13	Epithelialization	5	5	0.289	5	5	0.194	5	3.5	0.069	2	2	0.008*	0.06	0

C=Control, I=Intervention

Table 2

Comparison of Wound Measurement Continuum of Pre-Test Status by Weeks 1, 2, and 3 for Intervention and Control Groups

Group	Wound Status Continuum	Mean (S.D.)	p-value
	Pretest	45.63 (3.852)	0.001
Intervention	Week	142.88 (3.482)	
	Week	238.00 (2.204)	
	Week 3	32.25 (5.175)	
Repeated ANOVA test: analysis of post hoc <0.05 for all comparisons mean Pre-test vs Week 1 (p=0.14), Pre-test vs Week 2 (p=0.005), Pre-test vs Week 3 (p=0.005), Week 1 vs Week 2 (p=0.025), Week 2 vs Week 3 (p=0.013), Week 1 vs Week 3 (p=0.013), Week 2 vs Week 3 (p=0.019)			
Control	Pretest	42.89 (4.106)	0.013
	Week 1	42.11 (4.045)	
	Week 2	40.44 (4.640)	
	Week 3	39.67 (4.796)	
Repeated ANOVA test: analysis of post hoc p <0.05: Pre-test vs Week 1, (p=0.048), Pre-test vs week 3 (p=0.042),			

DISCUSSION

This study showed that Aloe vera gel accelerates wound healing in the third week of wound treatment, as proven by the BJWAT score. It has been impacted by changes in the wound status continuum, including necrosis tissue type, the number of necrotic tissues, exudate type, exudate amount, oedema, hardening of the margin, granulation tissue, and epithelialization. The use of Aloe vera gel in this study significantly changed the wound status continuum. There was a difference in the mean value of the wound status continuum at the pre-test weeks 1, 2, and 3. Although Aloe vera can be used to retain skin moisture, the use of Aloe vera to improve wound healing is recommended as the primary or complementary treatment alongside other methods. Several studies applying Aloe vera to wounds inhibit the migration of cells and growth factors leading to wound healing. In addition, aloe vera moistens the wound and allows optimal migration of fibroblasts and epidermal (22).

This study also found that wound care using Aloe vera gel once in two days was more effective and efficient than the care using 0.9 % NaCl once a day. During the intervention, nurses also noted that using Aloe vera gel saved more time and decreased the stress or pain experienced by the subjects in this study during wound care. In addition, a case report suggested that using aloe vera could reduce pain by blocking the synthesis of bradykinin, thromboxane synthase, and cyclooxygenase (22).

Aloe vera applied in this study could heal the wound faster than the application of conventional therapy. The changes could happen because Aloe vera contains glucomannan and gibberellins that stimulate fibroblast growth factor and proliferation to promote collagen synthesis. In addition, the active enzyme of bradykinesia and vitamins contained in Aloe vera gel can inhibit wound inflammation. Furthermore, Aloe vera gel can penetrate the skin or wounds to help heal (23). However, this study also showed that there were also changes in the wound healing of the control group. Nonetheless, some other studies showed that Aloe vera was still more effective than Saline Gas dressing and common treatment (22,23-25).

A previous study also found that wounds healed significantly in the intervention group (using Aloe vera gel) as compared to the control group (using normal saline and povidone-iodine) (26).

Even though there were significant changes in the wound healing process, this study proved there were some delays in the healing process (normally in 14 days), possibly due to several contributing factors, such as blood sugar level and nutritional status. The blood sugar might contribute to the wound healing process, as the above normal level indicates a not well-controlled condition, while well-controlled blood sugar can accelerate wound healing (27). In addition, the subjects in this study may also have inadequate nutritional intake, which can increase the risk of skin damage and slow wound healing. However, a further study that primarily measures blood sugar levels and nutritional status is needed to investigate and confirm their impact on the wound healing process. To sum up, Aloe vera gel proved to have a positive effect on improving the wound healing process since it contains glucomannan that influences the fibroblast growth factors and stimulates the production of collagen that accelerates wound improvement (28).

The main limitation of this study was the time restriction in applying the Aloe vera gel, which did not allow the researchers to show the full wound healing process. Additionally, the stage of the wound was not differentiated in the initial phase of this study. Furthermore, a limited number of subjects in this study and several contributing factors such as blood sugar level and nutritional status may also play some intervening roles that affect the research outcome, which accordingly must be considered in future studies to prove the definite and further impact of aloe vera gel on DFU patients.

CONCLUSION

This study found Aloe Vera gel can significantly accelerate the healing process of diabetic foot ulcers. In addition, wound care with Aloe Vera gel applies the principles of moisture to the wound and is also easy to apply. Therefore, the application of Aloe vera in the home care treatment for diabetic foot ulcer patients is recommended since it effectively improves wound healing and is significantly efficient for reducing labour costs and gauze in dressing.

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Coping strategies of healthcare providers on social stigma due to COVID-19 using the Roy adaptation model approach

Estrategias de afrontamiento de los proveedores de atención médica sobre el estigma social debido a COVID-19 utilizando el enfoque del modelo de adaptación de Roy

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SUMMARY

Introduction: *The negative stigmatization of COVID-19 in healthcare has caused psychosocial problems, including stress. An effective coping strategy is needed to overcome existing problems. This study aimed to determine healthcare providers' coping strategies and the social stigma about COVID-19 using Roy's adaptation model approach and its influencing factors.*
Methods: *The design used descriptive analysis with incidental sides, so the total sample size was 530 with accidental sampling. The instrument used was the Brief Cope Inventory, and the data were analyzed using a descriptive statistical test.*
Results: *The results showed that the median emotion-focused mean was 3.00, with the lowest mean number being 1.50 and the highest being 3.70. The median problem-focused mean was 3.17, with the lowest mean number being 2.00 and the highest number being 4.00. The median dysfunctional was 3.08, with the lowest mean being 1.75 and the highest number being 3.75. The proportion of coping strategies is mostly problem-focused at 62.8 %, emotion-focused at 21.5 %, and dysfunctional at 15.7 %.*
Conclusion: *Problem-focused coping involves active efforts to change or reduce sources of stressors as well as individuals tend to research causal relationships, plan, act, and adapt to stressful situations by acting directly on themselves or the environment. Someone who uses problem-focused coping is a form of adaptive adaptation.*

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Keywords: *coping strategies, COVID-19, stigma*

RESUMEN

Introducción: *La estigmatización negativa de la COVID-19 en el ámbito sanitario ha provocado problemas psicosociales, incluido el estrés. Se necesita una estrategia de afrontamiento eficaz para superar los problemas existentes. Este estudio tuvo como objetivo determinar las estrategias de afrontamiento de los proveedores de atención médica y el estigma social sobre COVID-19 utilizando el enfoque del modelo de adaptación de Roy y sus factores influyentes.*

Métodos: *El diseño utilizó el análisis descriptivo con lados incidentales, por lo que el tamaño total de la muestra fue de 530 con muestreo accidental. El instrumento utilizado fue el Brief Cope Inventory, y los datos fueron analizados mediante una prueba estadística descriptiva.*
Resultados: *Los resultados mostraron que la media centrada en la emoción mediana fue de 3,00, con la media más baja de 1,50 y la media más alta de 3,70. La mediana de la media centrada en el problema fue de 3,17, con la media más baja de 2,00 y la media más alta de 4,00. La mediana de disfuncionales fue de 3,08, con la media más baja de 1,75 y la media más alta de 3,75. La proporción de estrategias de afrontamiento principalmente se centra en el problema con un 62,8 %, centrada en la emoción con un 21,5 % y disfuncional con un 15,7 %.*
Conclusión: *El afrontamiento centrado en el problema implica esfuerzos activos para cambiar o reducir las fuentes de los factores estresantes, y los individuos tienden a investigar las relaciones causales, planificar, tomar medidas y adaptarse a las situaciones estresantes actuando directamente sobre sí mismos o sobre el entorno. Alguien que utiliza el afrontamiento centrado en el problema es una forma de adaptación adaptativa.*

Palabras clave: *Estrategias de afrontamiento, COVID-19, estigma.*

INTRODUCTION

The spread of COVID-19 is not only a health problem because is it radiated (1-3). This has led to changes in various aspects and unwittingly changed the behavior of people around the world, including, in this case, the perspective of each other (4-7). Changes in behavior and behavior between fellow humans occurred in Indonesia as a result of the COVID-19 pandemic, which in the end, is a negative social stigma aimed at healthcare who are at the forefront of handling COVID-19 patients (3,6,8-10). Social stigma in health is a negative relationship between a person or community with certain characteristics and diseases. In an outbreak, a person with a certain condition of disease will be labelled, stereotyped, discriminated against, treated separately, and experience loss of status because of a perceived relationship with an illness. The stigma associated with COVID-19 is based on three main factors: new diseases and unknown diseases, frequent fear of the unknown, and it is easy to associate this fear with other people (6,11-13).

The results of a survey by the Faculty of Nursing, University of Indonesia, and the Indonesian Mental Health Nurses Association show that as many as 140 nurses have felt humiliated by others because of their status as COVID-19 nurses or healthcare in the hospital where COVID-19 is being handled. This survey proves the rejection of nurses that the media have reported. The poll conducted in early April 2020 of 2 050 nurses throughout Indonesia also showed that 135 nurses had been asked to leave their homes. According to the survey, the real forms of rejection experienced by nurses include the threat of eviction (66 respondents), people around them avoiding by closing their house fences or doors when they see nurses (160 respondents), and the community also keeping away from the nurse's family (71 respondents) (14,15).

The results of a survey conducted by the Tsunami and Disaster Mitigation Research Center Team (TDMRC) of 1 132 respondents from 12 health professions in public health services in 23 districts or cities in Aceh, 90 % of respondents felt that they were significantly at risk of contracting the Coronavirus in carrying out their duties. Furthermore, most respondents claimed to have been rejected by residents because they know they handle Coronavirus patients. This negative stigmatization of COVID-19 for healthcare can cause adverse psychosocial problems, namely stress. Long-lasting stress will trigger psychological issues such as anxiety, fear, panic, depression, and helplessness. This stigmatized healthcare also thinks about the negative impacts that will be faced by their family and loved ones because they are also ridiculed and shunned. Therefore, coping strategies are needed. Coping in this situation is a process of controlling the stimulus to maintain the body's integrity and psychological (16-18).

Callista Roy popularized the theory that explains adaptive coping in 1960. Roy developed an adaptation model in the open systems model. A system is seen as having several interrelated elements to form a single goal-oriented unit. Roy's adaptation model describes how individuals can improve their health by maintaining adaptive behavior because humans are holistic beings with an adaptive system constantly adapting. This adaptive model can lead to positive and negative coping behaviors. The adaptive model consists of

four components such as 1) physiological mode, 2) self-concept mode, 3) role function mode, and 4) interdependency mode. The self-concept described by Roy refers to the need for mental integrity by interacting with oneself and others. Interaction with oneself, the basis of coping behaviour, includes physical and personal self. The physical self consists of self-sensation and self-image. The personal self consists of self-consistency, ideal self, and ethical and spiritual morals (19).

The results of the preliminary survey on 20 healthcare consisted of 4 doctors (20 %), 8 nurses (40 %), 4 nutritionists (20 %), 2 pharmacies (10 %), and 2 midwives (10 %). Most of the coping strategies used Emotion-Focused Coping Strategies with 10 respondents (50 %) tried to think positively and get closer to God. Problem-Focused Coping Strategies as many as 6 respondents (30 %) among them got motivation from colleagues and looked for solutions to the problems at hand. Dysfunctional Coping Strategies as many as 4 respondents (20 %) of whom were in denial and wanted to stop being in healthcare. Each individual uses different coping strategies in dealing with problems because humans are unique and have varying coping strategies. In general, coping is automatic when individuals experience pressure from outside and within. Individuals using coping strategies are influenced by several factors, including economy, abilities, skills, education and knowledge, social support, motivation, self-efficacy, position and work shift, and gender (20-22).

The coping strategies most often used by nurses are positive strategic approaches and reassessments, problem-based solutions, work planning, priority setting in work, seeking social support, and self-control. Meanwhile, coping strategies are rarely used, focusing on emotions such as avoidance, humour, rejection, self-blame, and acceptance of responsibility. Likewise, passive strategies such as asking God are reported to be rarely practiced (22). The previous study explains that every individual who experiences problems will use various coping strategies (21). A constructive coping strategy will allow individuals to adapt and support the functions of integration, growth, learning, and achieving goals. The inability of individuals to deal with problems constructively is the main cause of maladaptive behavior. Based on this description, it is necessary to conduct a study to describe the coping strategies used by health workers in Indonesia in dealing with the stigma caused by COVID-19 with Roy's adaptation approach and to determine healthcare providers' coping strategies and the social stigma about COVID-19 using Roy's adaptation model approach and its influencing factors.

METHODS

The design of this study was a descriptive analysis to determine the coping strategies of healthcare providers on social stigma due to COVID-19. The population was healthcare who worked in health services in Indonesia. The number of samples was 530 through the incidental sampling technique. The inclusion criteria in this study included: 1) The healthcare was someone who worked in health services with COVID-19 patients (hospitals, health centers, isolation homes); 2) Minimum education level of senior high school/equivalent; 3) Willing to be respondent. While the exclusion criteria were a non-healthcare provider who works in health services with COVID-19 patients. The research instrument used the Brief Cope Inventory developed by Carver (1989) (23) based on the theory of Lazarus and Folkman (1984) (24), consisting of 28 question items with 14 subscale items. The data analysis used descriptive statistics. Data collection was carried out using Google Forms in June 2020. Ethical test from the Sekolah Tinggi Ilmu Kesehatan Maluku Husada with number RK.012/KEPK/STIK/III/2021.

RESULTS

Respondent Characteristics

The analysis results are based on Table 1. Most respondents were female, as many as 365 (68.9 %) and the total number of male respondents is 165 (31.1 %). The proportion of married marital status was 408 respondents (77.0 %). The proportion of education levels, mostly diplomas, was 239 respondents (45.1 %). The proportion of profession of the most nurse was 417 respondents

(78.7 %). The proportion of work rotation (shift) was mostly rotations or shifts for as many as 360 respondents (67.9 %). The proportion of salary was the most appropriate to the Regional Minimum Wage for as many as 219 respondents (41.3 %). Finally, the proportion of living with most of the respondents live with their families, as many as 482 respondents (90.9 %).

Table 1

Respondent Characteristics

Variable	Mean	Median	SD	Min-Max	95 % CI
Lower-Upper					
Age	33.33	31.00	8.16	20-60	32.63-34.02
Length of working	9.65	7.00	7.83	1-36	8.99-10.32
	Variable			n	%
Gender	Man			165	31.1
	Women			365	68.9
Marital Status	Single			115	21.7
	Married			408	77.0
	Widower/Widow			7	1.3
Education Level	High School			2	0.4
	Diploma			239	45.1
	Bachelor			234	44.2
	Postgraduate			32	6.0
	Specialist			21	4.0
	Doctoral			2	0.4
Profession	Nurse			417	78.7
	Doctor			34	6.4
	Nutritionists			12	2.3
	Pharmacist			10	1.9
	Analyst/laboratory assistant			3	0.6
	Midwife			51	9.6
	Others			3	0.6
Shift	Yes			360	67.9
	No			170	32.1
Salary	Under Regional Minimum Wage			179	33.8
	Appropriate Regional Minimum Wage			219	41.3
	Above Regional Minimum Wage			132	24.9
Living with	Alone			20	3.8
	With Friend			28	5.3
	With Family			482	90.9

*Data was normally distributed.

The analysis results in Table 2 showed that the median emotion-focused mean was 3.00, with the lowest mean of 1.50 and the highest mean of 3.70. The median problem-focused mean was 3.17, with the lowest mean 2.00 and the highest mean 4.00. The median mean dysfunctional was 3.08, with the lowest mean of 1.75 and the highest mean of 3.75. The proportion of coping strategies was mostly problem-focused as many as 333 respondents (62.8 %), emotion-focused, as many as 114 respondents (21.5 %), and dysfunctional as many as 83 respondents (15.7 %). The proportion of coping adaptation was mostly adaptive coping, with as many as 447 respondents (83.4 %), and maladaptive coping as many as 83 respondents (15.7 %).

Table 2

Coping Strategies and Coping Adaptation

Variable	Mean	Median	SD	Min-Max	95 % CI
Lower-Upper					
Mean Emotion-Focused	2.98	3.00	0.28	1.50-3.70	2.95-3.00
Mean Problem-Focused	3.22	3.17	0.32	2.00-4.00	3.19-3.25
Mean Dysfunctional	3.04	3.08	0.27	1.75-3.75	3.01-3.06
Variable				n	%
Coping Strategies	Emotion-Focused Strategy Coping			114	21.5
	Problem-Focused Strategy Coping			333	62.8
	Dysfunctional Strategy Coping			83	15.7
Coping Adaptation	Adaptive			447	83.4
	Maladaptive			83	15.7

*Data was normally distributed

DISCUSSION

The results of a statistical analysis based on coping strategies showed that most of the proportions of coping strategies were problem-focused, as many as 333 respondents (62.8 %), emotion-focused, as many as 114 respondents (21.5 %), and dysfunctional as many as 83 respondents (15.7 %). Problem-focused coping involves active efforts to change or reduce sources of stressors. When using a problem-focused coping approach, individuals tend to research causal relationships, plan, take action and adapt to stressful situations by acting directly on themselves or the environment, which is similar to goal-oriented behavior (25,26).

Problem-focused coping strategies include active coping, instrumental coping, and planning. Active coping is concentrating efforts on doing something about a situation or taking action to try to make it better. Instrumental support is getting help and advice from others or trying to get advice or assistance from others about what to do. Planning or planning seeks to make a strategy about what to do or think hard about what steps to take (27). The respondent's characteristics can also influence the coping strategies shown by the respondent. Respondents' characteristics show a significant relationship with coping strategies such as age, gender, length of work, and salary.

A statistical analysis based on coping strategies showed that most of the proportion of coping adaptation was adaptive coping, as many as 447 respondents (83.4 %) and maladaptive coping, as many as 83 respondents (15.7 %). Roy describes humans, individually and in groups, as a holistic, adaptive system, complete with coping processes that sustain adaptation and promote the transformation of people and the environment. As with all types of systems, humans have internal processes that act to maintain the integrity of an individual or group. This process has been broadly categorized as a regulatory subsystem and a cognitive subsystem for people and a stabilizer and innovator for groups (28).

Roy's Adaptation Model defines the innate coping process and gets it into 2 sub-systems such as the regulator sub-system and the cognate subsystem. The regulatory sub-system consists of neurochemical and endocrine responses. Internal and external stimuli are social, physical, and psychological factors. The cognate sub-system is related to attention, memory, learning, problem-solving, decision-making, excitement, and defense status. The statistical analysis results show that most of the proportion of adaptation used by healthcare to the stigma of COVID-19 is an adaptive mechanism. The adaptive coping mechanism consists of problem-focused (consisting of acting coping, instrumental support, and planning) and emotion-focused

coping strategies (consisting of acceptance, emotional support, humor, positive reframing, and religion), meaning that coping strategies are used by healthcare. Includes innate and acquired coping processes that involve the regulator and cognate sub-systems (27,28).

CONCLUSION

The results related to COVID-19 are problem-focused and emotional-focused coping strategies, meaning that according to coping adaptation, Roy's Adaptation Model states that these strategies include adaptive coping mechanisms. Therefore, healthcare is expected to use coping strategies such as active coping, instrumental support, planning, acceptance, emotional support, humor, positive reframing, and religion because these are included in the Problem-focused and Emotion-focused Coping Strategies.

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Experience of Kaili Community in reducing pain and swelling because of filariasis disease

Experiencia de la comunidad de Kaili en la reducción del dolor y la inflamación a causa de la enfermedad de la filariasis

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SUMMARY

Introduction: *Filariasis has been common in Baluase area with complaints in the form of swelling in the legs. Patients who suffer from filariasis do not receive complete medication and often complain of swelling, pain, and disruption in their daily activities. In addition, they also often try traditional medication by applying decoction and buying drugs at the shop when they experience fever and pain in the legs. This study aimed to understand the culture of Kaili communities to reduce the symptoms of pain and swelling due to filariasis.*
Methods: *This study used a descriptive phenomenological qualitative design. Nine participants were recruited for the study using the purposive sampling technique. The data collection instruments employed included in-depth interviews. Interview guidelines were prepared based on the research objectives and were further translated into several questions to explore the patients' experiences. Data were obtained using in-depth interviews. The Colaizzi method was used for data analysis. All research processes utilized NVivo version 12.*
Results: *The result characterized four themes: knowledge about filariasis, filariasis treatment that patients have obtained, physical changes related to filariasis, and Lero wood which is hard to find.*
Conclusion: *Based on the result of the research, Filariasis disease causes physical changes in the patient and causes discomfort in the Kaili community. However, Lero wood can reduce complaints of pain and swell due to filariasis, as experienced by the Kaili community.*

Keywords: *Filariasis, Kaili culture, pain, swelling*

RESUMEN

Introducción: *La filariasis ha sido común en el área de Baluase con quejas por hinchazón en las piernas. Los pacientes que padecen filariasis no reciben la medicación completa y, a menudo, se quejan de hinchazón, dolor e interrupción de sus actividades diarias. Además, también suelen probar la medicación tradicional aplicando decocciones y comprando drogas en la tienda cuando experimentan fiebre y dolor en las piernas. Este estudio tuvo como objetivo comprender la cultura de las comunidades de Kaili para reducir los síntomas de dolor e hinchazón debido a la filariasis.*
Métodos: *Este estudio utilizó un diseño cualitativo fenomenológico descriptivo. Nueve participantes fueron reclutados para el estudio utilizando la técnica de muestreo intencional. Los instrumentos de recolección de datos empleados incluyeron entrevistas*

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en profundidad. Las pautas de la entrevista se prepararon en base a los objetivos de la investigación y luego se tradujeron en varias preguntas para explorar las experiencias de los pacientes. Los datos se obtuvieron mediante entrevistas en profundidad. Se utilizó el método de Colaizzi para el análisis de datos. Todos los procesos de investigación utilizaron la versión 12 de Nvivo.

Resultados: *El resultado caracterizó cuatro temas: conocimiento sobre la filariasis, tratamiento de la filariasis que han obtenido los pacientes, cambios físicos relacionados con la filariasis y madera de Lero que es difícil de encontrar.*

Conclusión: *Con base en el resultado de la investigación, la enfermedad de filariasis provoca cambios físicos en el paciente y causa malestar en la comunidad de Kaili. Sin embargo, la madera de Lero puede reducir las quejas de dolor e hinchazón debido a la filariasis, como lo experimentó la comunidad de Kaili.*

Palabras Clave: *Filariasis, cultura Kaili, dolor, tumefacción.*

INTRODUCTION

863 million people in 47 countries worldwide remain threatened by lymphatic filariasis, and about 51 million people were infected in 2018, a 74 % decline since the WHO's Global Program to eliminate Lymphatic Filariasis in 2000 (1). Almost all regions of Indonesia are filariasis endemic areas, especially Eastern Indonesia, which has a higher prevalence of 14 000 cases spread over 401 regencies/cities (2). Data from Central Sulawesi, filariasis sufferers, were found in 172 cases, and nine regencies were considered endemic regions. Sigi Regency ranks second after Poso with 56 cases (3). Geographically, Sigi Regency has endemic areas suitable for breeding places for mosquitoes that transmit live lymphatic filariasis, namely swamp areas, dirty water, rice fields, and forests (4,5).

This disease is being ignored because there is no strategic interest from any party. This disease is associated with nutritional problems, environmental hygiene, and poverty. It causes socioeconomic losses and permanent disability, World Health Organization (WHO) set this disease to be eliminated worldwide (1,6,7). Filariasis remains one of the world's most debilitating parasitic infections and is a significant contributor to poor health in many endemic countries, including Indonesia (8,9). Therefore, Indonesia also accelerated efforts to control filariasis. In 2000 WHO declared "The Global Goals of Elimination of Lymphatic Filariasis as a Public Health Problem by the Year 2020". In line with that, Indonesia has established the Filariasis Elimination Program as one of the national priorities for eradicating infectious diseases following the Presidential Regulation of the Republic of Indonesia number 7 of 2005 concerning the National Medium-Term Development Plan 2004-2009. Filariasis prevalence rate 19 %. This means that 40 million people could suffer from filariasis if mass drug administration, prevention of filariasis, and planned activities toward eliminating filariasis in Indonesia are not carried out by 2020 (4).

The Ministry of Health estimation result states that the annual economic loss of filariasis reaches 43 trillion rupiahs if the filariasis control program is not carried out. Therefore, effective intervention and efficient use of resources through systematic and strategic efforts will result in savings for the State. For this reason, a systematic plan at the national level is needed to overcome this problem, namely by establishing two pillars of activity to be taken: Breaking the chain of transmission by administering Mass Filariasis Prevention Drugs in endemic areas by using Diethylcarbamazine (DEC) 6 mg/kg body weight and combined with albendazole 400 mg once a year for a minimum of 5 years. Treatment of clinical cases of filariasis, both acute and chronic clinical cases. Mass preventive drug administration filariasis is implemented on a district/city basis (2).

Filariasis symptoms include lymphoedema, elephantiasis, and scrotal swelling, which occur later in life and can lead to permanent disability (1). In addition, body deformities often lead to social stigma and sub-optimal mental health, loss of income, earning opportunities, and increased medical expenses for patients and their families (2,10). Patients in acute conditions will have local inflammation involving the skin, lymph nodes, and lymphatic vessels, often accompanied by chronic lymphoedema, and even experience lymphatic system damage (10,11).

Based on the results of preliminary interviews with public health center officers, it was found that there were ten people with filariasis in the Baluse Health Center working area. The last new case was detected in 1997. The main treatment program provided to reduce the complaints of filariasis is by consuming drugs (12), and several patients even need chemotherapy (1). Another interview conducted with filariasis sufferers who have suffered from this disease since 1962 said that he always gets medicine from the public health center. Still, if the disease recurs, the pain and swelling in the leg area are disturbing. However, the patient does not go to the public health center to receive treatment since he prefers traditional medication. They are Kaili tribesmen who have a lot of "village medicine" to treat this disease, including using "Lero wood", which has been scraped from the stem, added to salt, and then used to compress swollen or injured feet. The patient prefers traditional medication due to the side effects of drugs, such as fever, headache, muscle aches, nausea, and dizziness (13). The purpose of this study was to determine the habits of the Kaili tribe to deal with pain and swelling due to the symptoms of filariasis.

METHODS

Design and Population Study

This study was a descriptive qualitative approach with thematic analysis. Interviews were conducted using semi-structured interview guidelines and open-ended questions. Nine patients with filariasis, one community leader, a traditional healer, and a program holder at the public health center, in Sigi Regency, Indonesia, participated in this study by purposive sampling. Participants willing to participate in the study are 50-75 years old and in the acute filariasis phase (the legs are swollen and feel pain). The most informant said they had filariasis for about 35 years, one person was around 20 years old, and the longest was 60 years. All participants gave their informed consent to participate in the study approved by the ethics committee for Poltekkes Kemenkes Yogyakarta number LB.01.01/KE/XLIV/417/2016.

Data Collection

Data were collected through semi-structured in depth-interview, and measure pain scales were performed on all subjects. First, researchers observed daily filariasis patients using videos, notes and observation sheets, interview guidelines, logbooks, and field notes. Next, a thematic analysis was used to identify the experiences and meanings of the views in each participant's transcript. In the phenomenology approach, the meaning of a participant's life experience comprises the key thematic points in the findings. The data analysis process employed in this study followed the steps described by Colaizzi (1978) using the Nvivo12 application. The intervention activities were carried out from 12 July to 03 August 2016 in 6 villages in Sigi Biromaru Regency.

RESULTS

The participants were twelve people as shown in Table 1. It consists of eight men and four women. Nine of them work as farmers in gardens or rice fields with two participants being retired teachers but also working as farmers daily. About five participants are only finished elementary school level. One participant did not attend school. The youngest participant was 48 years old, and the oldest was 75. Most of them

Table 1

Participants demographic data

Sex	Age (years)	Job	Education level
Male	48	Retired	Teacher/FarmerCollege
Female	59	Farmer	Primary school
Male	71	Farmer	Primary school
Female	57	Farmer	Senior high school
Male	75	Farmer	Not Attend School
Male	67	Farmer	Primary school
Male	68	Farmer	Primary school
Male	70	Retired	Teacher/FarmerCollege
Female	50	Farmer	Primary school
Female	50	Public figure	College
Male	52	Public figure	Senior high school
Male	55	Public figure	Senior high school

have had filariasis since before 1980, the longest being in the 1950s, around 60 years. Participant number 10th, 11th, and 12th was a public figure. There are four themes of this research in Table 2 and explained below:

Table 2

Summary of Themes

Themes
Theme 1: Knowledge related to filariasis
Theme 2: Filariasis treatment that patients have obtained
Theme 3: Physical changes related to filariasis
Theme 4: Lero wood which is hard to find.

Theme 1: Knowledge related to filariasis

There are two sub-themes related to the knowledge related to filariasis: having had filariasis for a long time and not knowing the cause of filariasis. Most of the participants said they had had filariasis for a long time. Before 1980, the average was in the 1970s, when they were still children. Even the longest was in the 1950s, as revealed by participant 5, who is a 75-year-old male. The same thing was also revealed by participant 7 that he experienced this in 1968 when he was in the 4th grade of elementary school (in the past, his name was SR). This means that most of them have had filariasis for more than 50 years. This was expressed by se*veral participants as follows:*

"It's been a long time… it's been a long time. … I was in the school at that time was school since 1950 (P3)".

For the second sub-theme, all participants said they did not know the cause was due to filarial worms. Some participants said they got sick because of paranormal activities. Such as the following:

"I brought to traditional healer… the nails were removed… there were needles… recently before this fast…not even nails…like the tailor's needle (P1)."

Even the 9th participant, a woman, believed that she was being abused. She said this:

"I don't know what the pain is. Because I used to take a bath in Kuala. Some parents broke through, they passed, and when they passed, Grandpa, I was surprised, I took a shower so that I couldn't stand up. It hurts all my legs. I just lifted it there. I cry (Big) (P9)."

Theme 2: Filariasis treatment that patients have obtained

There were four sub-themes found related to the filariasis treatment theme undertaken. The four sub-themes are as follows 1) mass treatment carried out by the government in 1993; 2) self-medicating with over-the-counter drugs; 3) Try various kinds of traditional medicine; 4) Don't use banana stems anymore**.** The description is as follows:

In 1993 in the working area of the Baluse Health Center, mass treatment of filarial was carried out. The program holder revealed this. All residents received filariasis drugs distributed by the government through the Health Service. Although some participants got the drug and took it, some did not take it for fear of getting sick. At that time, most residents were sick taking the medicine that was distributed. They wonder why taking medicine hurts. Participant 3, who is 71 years old, experienced symptoms of filariasis when he was in grade 3 SR and already had persistent symptoms where the participant's right leg appeared swollen.

"Never-ever. There's a drug…a combination… a medication. I have been given this drug. Everyone is sick, but I am not. Treatment is from health. there is that…. I'm not all sick people. Usually, sick people, because it's finished, please give me, I eat until I run out, nothing. There is a yellow, rather large he has seeds. Anyway, it's been shared before. How many villages are, on average, not just Bulubete, Proud, Walatana, Bulubete? All of them are divided up there, everyone is sick, but I'm not sick.. ask people, but I'm not (P3)."

However, several participants had not received treatment, namely participants 4th, 5th, 6th, and 9th, because treatment was not in place as stated by the youngest participant, namely participant number 9th, a woman aged 50 years, as described below:

"I haven't been here for treatment yet; still on the ground was waiting for some time (P9).

This was confirmed by the program holder, Mrs. R, a nurse on duty at Baluse who has held this program since 1993. According to her, she had received mass treatment in 1993, as stated in her statement:

"Ai, it's been a long time since…. 93. At that time, we came for treatment. All treatment. It was all sick

The interesting thing that was obtained from all the participants was that they did not believe they had filariasis because their peripheral blood examination results were negative. Even though they had persistent symptoms, they thought they only had malaria because the symptoms were almost the same, starting with chills and after taking the sold malaria medicine. Symptom-free disappears. Even most drink super tetra. Some participants come to health workers when sick, but most treat themselves, so this was appointed as the second sub-theme, self-medication. As stated by several participants:

"Just super tetras. So is amoxicillin. Only amoxicillin. Once I (P3)

Sub-theme 3 people try various kinds of traditional medicine. The local community has various conventional treatments, but the most common is using ground black rice as powder. Most participants said they had tried traditional medicine but felt tired after using it disappeared, but later, when not used, the symptoms reappeared. So, some of them feel tired of trying it. Below are the participants who said they used black rice as a powder:

"Usually use powder, jasmine flowers. Jasmine flower, rice, uh, what is it? (thinking) turmeric. Oh, turmeric. Uh, that's a lot of mixed-up… uh aromatic ginger, jasmine, rice, what is it… pomegranate leaf. All pounded. What's new?… feels good when given (P2)

Some use leaves:

"It could be such and such leaves, and we say that such and such leaves are Sirandi, perhaps what is the name of the leaf. It is ground, and then it is given like this (stuck to the leg) (P6)."

"Leaves. I also remember that the shaman said that the eggplant leaves were burned until they were black. If there is no change, you don't have to use them. Burned until charred, drunk. There are changes. But it will come back again (P8)."

Others use salt to relieve itching

"I'm scratching like that. I take salt. Rub on the feet. If it itches, use it again (P5)."

In addition, some say his feet were buried:

"Many I have treatment, I give boiling water, then dig a hole. I planted it, as you said earlier. Close it. Then there is a small hole. I pour the hot water there. There is distance. So about 10 minutes, I gave it out. That's a lot of water coming out (P8)."

The 4th sub-theme no longer uses banana stems. All participants said they did not use banana stems because after using their feet, there would still be a participant who said that he had used tofu and had used banana stems. Some participants said they did not use it because they heard information that caused itching, so they gave up. This was done by participant 6 with the following statements:

"It's also normal to try that, and the banana stem is here. napopo banana stem, But I think it's all itchy… If you give it a run (the banana). If you use it, itches again (P6)."

Theme 3: Physical changes related to filariasis

There are two sub-themes of this theme, namely 1) experiencing physical changes and 2) the disease often recurs. The explanation of sub-theme 1 is as follows:

All respondents said they experienced physical changes. Perceived changes vary. The observations of participants 1, 3, 5, and 6 observed persistent symptoms of enlarged legs and even P6, and both legs had enlarged. The participants who did not appear to be enlarged were 2, 4, 7, 8, and 9. However, all nine had clinical symptoms of filarial, although their examinations were

negative several times. Symptoms are felt. Some are swollen, painful, and itchy, and some are just itching and red. But everyone agrees that if you have a relapse, your feet will swell or be bigger than your usual size. Below is the statement of participant 1, who is a retired teacher:

"Pain, heat, pain, itching.. Nothing. Just like that. It's just itching (P1)."

The second sub-theme is frequent relapse. Most participants said they would experience pain, swelling in their legs, and fever if they ate cooked but not cooked food. The most common are unripe corn, burnt bananas, undercooked bananas, and rice. Among them were revealed participants 3 and 7 when eating uncooked rice:

"If it's just that there's no pain, except if I eat half-cooked things, I get sick, like half-cooked rice, I'll immediately get sick. one day I don't keep going (P3)."

But some participants said the disease would be recurrent if they were too tired to work. Here's his statement:

"Yeah… but it hasn't been swollen for a long time. Let's make it like this. If my work if I'm tired.. emmm.. (P4)

"…. I don't know why. Tired….. eui is already destroyed (P9).

The traditional healer also said the same thing: half-cooked food and long walks caused his illness to recur.

"That's right, eating half-cooked food makes you sick, hot, swollen, it hurts (groins). What's more, it's far away."

Theme 4: Lero wood Which is hard to find

All respondents said they had heard of using Lero wood to reduce pain and swelling, but not all had tried it. This is because Lero wood is hard to find. Following are the statements of participant 4, who have used Lero wood:

"It's normal too. Then I used to use the Lero wood too.. I was given the skin and so and so, just pasted it on. Your Tina Roa uses Lero wood" (P4)

Some participants said that they had heard of Lero wood but did not use it because they were lazy or that it was difficult to find the Lero wood because of its location in the mountains.

"I don't know which one. It is Lero wood. I'm old. But do not know me. Hard to find..(P8)."

In addition, the Lero wood should be used for 24 hours, and the following is the statement:

"If it's already attached, it doesn't run (fall) because it's stuck to the leg. So, if you want it to be good, for example, this afternoon it's pasted, then the next afternoon, it's just taken off. That's a good one. I have a cancer patient who is so trying this. 90 days at most. There is also a leg of this elephant named katum, so it doesn't spread its roots."

DISCUSSION

Based on the study, patients had filariasis for a long time and did not know about the cause of filariasis. Therefore, they did not realize that it was due to filarial worms. However, they have provided education several times to the patients. The nurses have also conducted home visits to explain the possible cause of their suffered filariasis. According to the researchers' opinion, this might be caused by the respondents' old age, which is in the range of 50 years old to 75 years old. In addition, the respondents also had low education levels, and only two had diplomas. In this case, they have been suffering from filariasis since 1980.

Furthermore, they also live in the village area, which is around 38.7 km from Palu City, and most work as farmers. Filariasis patients must know about the disease, signs, and symptoms to improve their efficacy in managing themselves by treating their disease and preventing it from reoccurring. The patient's learning needs are met by learning about their disease condition and treatment skill, complaint management, and medication (14). Therefore, health workers need to provide health education for the patients and family members (15) and involve the community in the Indonesian context to improve their life skills (16). Behavioral changes in a person can be known through perception. Health

perception is the experience of an individual about feeling sick, disease, health services, and health programs generated through the senses of sight, hearing, smell, and so on. Everyone has a different perception, even though the object is the same (17).

The behavior of participants in seeking treatment is very high. This can be seen from their experience of trying various kinds of treatment, be it traditional, or self-medicating with over-the-counter drugs. Some will go directly to health workers when they feel their illness begins to recur. Participants realized they were sick, but some did not believe they had filariasis. They always assume that they suffer from other illnesses such as malaria. Hence, they take malaria drugs and antibiotics that have long been withdrawn from the market, and some even combine super tetra and amoxicillin. Participants' behavior in seeking treatment is in line with the theory of health behavior, where behavior is something activity or activity that is organic and concerned that Everyone is different in responding. Therefore, influencing behavior in giving a response shared becomes an internal and external factor. Internal factors include knowledge, perception, emotional level, intelligence level, motivation, emotion, and so on, which function to process external influences. External factors include physical, social, cultural, economic, political, etc., which made the target realize the form of behavior (17).

Participants also used a lot of traditional medicines because they knew the customs, which are cultural treasures. It can be seen from their statement that the filariasis disease is called "arrival" shows that this disease is already known in the community and the treatment already exists. They trust traditional healers to treat their pain. It is shown by some of the participants claiming to have visited Traditional healers and followed the advice or suggestions given. But they were tired because conventional medicine was a bit of a hassle, so they used over-the-counter medicines from the public health canter. Patient compliance with the treatment program that has been set is affected by their education level and the length of treatment they have received. The higher the education level they have and the longer the treatment they have received, then the higher the patient compliance with the treatment that has been programmed (18).

The 9 participants involved in the study had a range of mild to moderate pain. After compressing the feet with filariasis using wood Lero, the patient's pain scale decreased by 1 point. Pain is felt sometimes. The researcher assumed that the decrease in the pain scale was due to the effect of the intervention given to the participants. Structurally, it can be seen that Lero wood is inherent to the feet and is a soft part, of course giving a comfortable feeling. This is supported by the opinion of a key figure who said that this Lero wood has a cooling effect, and when it is compressed on swollen feet, it will cause a cold and comfortable feeling. This wood sticks well and is strong on the feet, and it can even be used for walking because it will not fall. The efficacy of Lero wood itself is to reduce swelling or arrive. In addition, the feeling of comfort can be caused by a good perception or response from participants to the drugs used because they are tired of trying all the recommended treatments, be it traditional medicine using natural ingredients, such as powder or herbal leaves. In addition, they have also heard about the use of Lero wood, but most of them do not use it because they do not know where to get the wood and what it looks like. With the availability of Lero wood, they become more enthusiastic, which creates confidence in themselves. The decrease in the pain scale felt by the participants was different because it was influenced by the stimulus or their level of trust in traditional medicine. Perception is the experience of objects, events, or relationships obtained by inferring information and interpreting messages. Perception gives meaning to sensory stimuli (10,17).

An individual does not react or behave in a certain way but behaves according to what he sees or believes about certain situations. Traditional medicine is the ancient and culture-bound medical practice that existed in human societies before the application of modern science to health. The practice of traditional medicine varies widely, in keeping with the societal and cultural heritage of different countries. Every human community responds to the challenge of maintaining health and treating diseases by developing a medical system (19). The selection of traditional treatment

carried out by the patients is based on their beliefs and the culture of the local communities (20). Lero wood is hard to find. This follows the opinion of Ashari, the traditional healer. Therefore, the handling of elephantiasis in the community varies. It is narrated that the handling of elephantiasis, besides using Lero wood or rotten banana stems, also using large leaves, pemboka onions, turmeric, and bamboo. The way to treat it is by scallion mixed with pemboka leaves and turmeric. Then put into bamboo, then put into bamboo and then burned. After that, it is applied to the swollen feet.

Culture is a way of life that is shared by a group of people and passed down from generation to generation. Culture is a comprehensive way of life. Culture is complex, abstract, and broad. Many aspects of culture also determine communicative behavior. These socio-cultural elements include many human social activities (21). Culture comprises many complex elements, including religious and political systems, customs, languages, tools, clothing, buildings, and works of art. Language, like culture, is an inseparable part of human beings, so many people think of it as genetically inherited. However, when someone tries to communicate with people from different cultures and adjusts their differences, it proves that culture is learned (21). Traditional treatment can come from both animals and plants. However, it is sometimes difficult to find plants because they grow in the forest, so this kind of use of traditional knowledge should not be overlooked while framing the strategies of conservation and management of faunistic resources in the investigated area (20).

This study has several strengths; first, it describes the community experiences in depth through the interview that has been done. Second, it involves the public figure, the program holder, and clients so that complete experiences can be informed. Furthermore, the limitation of this research is that the participant used the local language, so the researcher needed a language expert to translate the interview transcription.

CONCLUSION

Based on the result of the research, Filariasis disease causes physical changes in the patient and causes discomfort. The result characterized four themes: knowledge about filariasis, filariasis treatment that patients have obtained, physical changes related to filariasis, and Lero wood which is hard to find.

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Knowledge and reliance on the availability of voluntary counseling and testing (VCT) services relating to the utilization of VCT services by the Man who has Sex with Man community

Conocimiento y confianza en la disponibilidad de servicios de consejería y pruebas voluntarias (VCT) relacionadas con la utilización de servicios de VCT de masculinos que tienen sexo con la comunidad masculina

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SUMMARY

Introduction: *Southeast Asia is the second continent that has a higher population of Human Immunodeficiency Virus (HIV) infection. Indonesia needs to be vigilant to prevent the spreading and transmission of this virus. One of the services provided by the government for the initial screening of HIV/AIDS is Voluntary Counseling and Testing (VCT). This research aimed to identify the behavior factors related to the utilization of VCT services by the Man who has Sex with Man (MSM) community.*

Methods: *This study used a cross-sectional correlational research design to describe the relationship between behaviour factors to the utilization of VCT services by the MSM community. The population in this research is the community of MSM. The samples were 50 with consecutive sampling techniques. The data was collected by using questionnaires. The Chi-square test and regression were used to analyze and predict the relationship between the frequency distribution of knowledge, reliance on services, stigma, and discrimination with VCT services.*

Results: *The results of this research showed that from 50 subjects, 86 % had good knowledge about HIV and VCT, 78 % had a reliance on service availability, and 82 % had a stigma and positive discrimination. The Chi-Square test result described a significant correlation between knowledge (p-value=0.033, OR=11.200) and reliance on VCT service availability (p-value=0.036, OR=5.333) with the utilization of VCT services. The statistical test showed that the most influential variable in the use of VCT services is the predisposing factor (sig=0.028, p-Value<0.006) consists of the knowledge and belief in the services of the VCT, and there is no relationship between stigma & discrimination against HIV/AIDS with the utilization of VCT services.*

Conclusion: *This study concludes that knowledge about HIV and VCT and the faith in VCT related to VCT services utilization by the community of MSM. The recommendation to the officer VCT clinic is to promote the community of MSM with more effective, planned schedules and cross-sectoral collaborations.*

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Keywords: *Knowledge, man sex man, reliance, VCT service utilization.*

RESUMEN

Introducción: *El sudeste asiático es el segundo continente con mayor población de infectados por el Virus de la Inmunodeficiencia Humana (VIH). Indonesia debe estar atenta para evitar la propagación y transmisión de este virus. Uno de los servicios proporcionados por el gobierno para la detección inicial del VIH/SIDA es el Asesoramiento y Pruebas Voluntarias (VCT). Esta investigación tuvo como objetivo identificar los factores de comportamiento relacionados con la utilización de los servicios de VCT por parte de la comunidad Man Sex Man (HSH).*
Métodos: *Este estudio utilizó un diseño de investigación correlacional transversal para describir la relación entre los factores de comportamiento y la utilización de los servicios de APV por parte de la comunidad de HSH. La población en esta investigación es la comunidad de HSH. Las muestras fueron 50 con técnicas de muestreo consecutivo. Los datos se recopilaron mediante el uso de cuestionarios. Se utilizaron la prueba de Chi-cuadrado y la regresión para analizar y predecir la relación entre la distribución de frecuencias del conocimiento, la dependencia de los servicios, el estigma y la discriminación con los servicios de VCT.*
Resultados: *Los resultados de esta investigación mostraron que, de 50 muestras, el 86 % tenía un buen conocimiento sobre el VIH y APV, el 78 % confiaba en la disponibilidad del servicio y el 82 % tenía estigma y discriminación positiva. El resultado de la prueba de chi-cuadrado describió una correlación significativa entre el conocimiento (valor de p = 0,033, OR = 11,200) y la confianza en la disponibilidad del servicio de APV (valor de p = 0,036, OR = 5,333) con la utilización de los servicios de APV. La prueba estadística mostró que la variable más influyente en el uso de los servicios de APV es el factor predisponente (sig=0.028, p-Valor<0.006) consiste en el conocimiento y creencia en los servicios de APV, y no existe relación entre estigma y discriminación contra el VIH/SIDA con la utilización de los servicios de APV.*
Conclusión: *Este estudio concluye que el conocimiento sobre el VIH y el APV y la fe en el APV se relacionan con la utilización de los servicios de APV por parte de la comunidad de HSH. La recomendación para la clínica VCT oficial es promover la comunidad de HSH con cronogramas planificados más efectivos y colaboraciones intersectoriales.*

Palabras clave: *Conocimiento, hombre sexo hombre, confianza, utilización del servicio VCT.*

INTRODUCTION

Voluntary Counseling and Testing (VCT) is one service the government provides for the early detection of diseases caused by Human Immunodeficiency Virus (HIV) infection. The Indonesian Ministry of Health reported 50 282 HIV cases, and people with Acquired Immunodeficiency Syndrome (AIDS) reached 7 036. The male and female ratio is approximately 2:1, with the highest risk factors being risky sex in heterosexuals 70 %, homosexuals 22 % including male sex men (MSM), bisexuals 2 %, from HIV positive mothers to children 2 %, and transfusion 2 %. The transmission mode through sexual intercourse, whether heterosexual, homosexual, or bisexual, is still the highest, with the MSM group ranking third for the percentage of 8.05 % HIV positive with a total of 8 929 people. If the findings are compared to the population, West Sumatra, Indonesia, is ranked 7th out of 37 provinces with the highest case rate of 21.59 %, and findings in Bukittinggi City are the second largest after Padang City (1,2).

Specialist in internal medicine and consultant for tropical and infectious diseases at Dr. M Djamil Hospital, Padang, (3) stated that same-sex is a risk factor for HIV/AIDS which is currently showing an increasing number of cases. The increasing number can see this of inpatient and outpatient cases of patients with Sexually Transmitted Infections (STIs) and HIV/AIDS in Indonesia. The results of the 2014 disease observation and control agency research at Bukittinggi City Hospital showed that there were 33 HIV/AIDS cases (in 2012), which increased to 40 cases (in 2013), a sharp increase of 72 cases (2014), 34 cases (2020), and 18 cases (2021) when viewed from the cumulative number of people living with HIV/AIDS, most of them are male (82.07 %). This aligns with data from the Bukittinggi City HIV/AIDS Commission. Based on data collection in the field, 383 people total MSM were found in the city of Bukittinggi in 2018, which decreased in 2019 with 307 people found (2). Meanwhile, those who accessed VCT services were only 62 people and 18 HIV-positive people in 2016, and this continues to increase every year (2).

Several studies reveal several factors behind the high cases of HIV/AIDS, including

behavioural factors, knowledge factors, service utilization factors, environmental support factors, and family factors (4-9). Carrying out an HIV test is still frightening for various reasons, including stigma and community discrimination. Lack of knowledge and understanding of HIV/AIDS, misperceptions about how HIV is transmitted, lack of access to treatment, and environmental factors can reinforce stigmatization associated with HIV/AIDS. Fatmala study in 2016 concluded that predisposing factors that influence VCT services by MSM are knowledge and perception, enabling factors that influence information and availability of facilities. Reinforcing factors are encouragement from friends or community as well as attitudes and behaviour of health care workers (10,11).

HIV counseling and testing or VCT is a counseling activity that provides psychological services, information, and knowledge of HIV/AIDS prevents HIV transmission, promotes responsible behaviour change, and anti-retroviral (ARV) treatment, and ensures various problems related to HIV/AIDS change behaviour towards healthier behaviour and safer (12,13). Behaviour is an action or activity of the human itself. Human behaviour is all human activities or activities, both those that are directly observed and those that cannot be observed by outsiders (14). Utilization of health services in every effort carried out alone or jointly within an organization to maintain and improve health, prevent and cure disease and restore health, the health of individuals, families, groups, and communities (14-16).

Factors related to service utilization VCT, such as education and knowledge, are characteristics that reflect an individual's or family's social circumstances (17). Education also affects a person to seek health services according to their knowledge (15,18). The higher a person's education, the higher their desire to seek health services. Individuals with higher education will be more aware of the importance of using health services. According to (14), reliance on the use of services is one factor in a person's readiness to behave or act. Stigma is a negative characteristic that attaches to a person's personality because of the influence of his environment. While the stigma associated with HIV/AIDS is all attitudes that are unpleasant and shown to those living with HIV/AIDS or people living with HIV/AIDS (PLWHA) and towards their loved ones, close friends, social groups, and society. This research aimed to identify the behaviour factors related to the utilization of VCT services by the Man who has Sex with Man (MSM) community.

METHODS

This study uses a research design descriptive quantitative correlation with a method approach cross-sectional study. The sample in this study was taken using a simple random sampling technique with a sample of 50 people who were cooperative during the research. The approach taken to recruit research samples was carried out by using 'intermediaries' for this MSM community, where intermediaries were individual alumni of the MSM community, making it easier for researchers to communicate with respondents. This study aims to determine the relationship between behavioral factors that affect the use of VCT services in the MSM community in the form of predisposing factors, including knowledge, enabling factors to include: reliance on the availability of VCT services, and reinforcing factors (reinforcing factors) include stigma and discrimination in the MSM community in Bukittinggi City.

Data collection in this study used a questionnaire for all factors to be observed and the use of VCT services, with a total of 20 question items consisting of 5 questions for the knowledge factor, 5 questions for the reliance factor in the availability of VCT services, 5 questions for stigma and discrimination of the MSM community and 5 questions on the use of VCT services that contain positive and negative types of questions. As a result, the interpretation of the results used for each factor is different for the knowledge factor: good and sufficient, the belief in VCT services and the stigma and discrimination of the MSM community: positive and negative, and for the use of VCT services: using and not utilizing. Statistical analysis used to determine the relationship between factors was Chi-Square and logistic regression to predict the probability of each factor using the SPSS Ver.23 statistical program.

RESULTS

The results of the research that can be observed in Table 1 that shows that more than half of the MSM community age is a teenager with a total number of 27 people (54 %), unmarried, namely 47 people (94 %), and at the secondary education level, which is 32 people (64 %).

Table 1 concerning on distribution of respondents shows that the predisposing factors are: good knowledge about HIV/AIDS and VCT in as many as 43 people (86 %). They were supporting factor/Enabling factor: positive belief in the availability of VCT services for as many as 39 people (78 %). Factors that have reinforcing factors: positive stigma and discrimination are 41 people (82 %), while the utilization of VCT services in the MSM community is 29 people (58 %).

Table 1

Frequency Distribution of Respondents' Characteristics in MSM Community

Characteristics	Frequency	%
Age		
Teenager	27	54
Early adulthood	22	44
Late Adult	1	2
Marital status		
Not married yet	47	94
Divorce	3	6
Level of education		
Low	14	28
Intermediate	32	64
High	4	8
Knowledge of HIV/AIDS and VCT Services		
Well	43	86
Enough	7	14
VCT Service Availability Reliance		
Positive	39	78
Negative	11	22
HIV/AIDS Stigma and Discrimination		
Positive	41	82
Negative	9	18
Utilization of VCT Services		
Utilize	29	58
Not Utilizing	21	42
Total	50	100

Table 2 concerning the utilization of VCT service shows that out of 43 MSM who have good knowledge and utilize VCT services, 28 people (65.1 %). The results of the Chi-Square statistical analysis to determine the relationship between each behavioral factor and the use of VCT services by MSM community groups in the city of Bukittinggi were obtained for the knowledge factor and the belief factor in the availability of VCT services that had a statistically significant relationship with a p-value <0.05 (p=0.033 and 0.036) with the use of VCT services by the MSM community. In contrast, the stigma and discrimination factors for HIV/AIDS had no relationship with the use of VCT services by the MSM community with p>0.005 (p=0.716). The results of statistical regression analysis to predict the probability of these factors on the utilization of VCT services by the MSM group were for the knowledge factor. It was found that MSM with good knowledge of HIV/AIDS and VCT services had the opportunity to use these services by 11.2 times (OR=11,200) compared to MSM with sufficient knowledge. Furthermore, MSM communities who have a positive belief in the availability of VCT services have a 5.3

Table 2

Relationship of Knowledge Factors, Reliance Factors, HIV/AIDS Stigma, and Discrimination Factors with Utilization of VCT Services in Communities MSM

Behavioural Factors	Utilization of VCT Services			
	Utilize n (%)	Not Utilizing n (%)	OR (CI 95 %)	p-value
Knowledge of HIV/AIDS and VCT Services				
Well	28 (65.1)	15 (34.9)	11,200	
Enough	1 (14.3)	6 (85.7)	(1,231-101,886)	0.033
VCT Service Availability Confidence				
Positive	26 (66.7)	13 (33.3)	5,333	
Negative	3 (27.3)	8 (72.7)	(1,209-23,536)	0.036
HIV/AIDS Stigma and Discrimination				
Positive	23 (56.1)	18 (43.9)	0.639	
Negative	6 (66.7)	3 (33.3)	(0.140-2.912)	0.716

times chance (OR=5,333) to utilize VCT services compared to those who have negative beliefs, and stigma and discrimination have no chance in the use of VCT services by the MSM community.

DISCUSSION

Based on the results of this study, it can be seen that respondents with good knowledge will use VCT services. This is the same as the research conducted by (19), which reported that most people with high knowledge tend to use VCT clinics. According to (14), knowledge results from knowing, which occurs after someone has sensed a certain object. Knowledge is not only obtained from formal education but can also be obtained through experience. A person's knowledge of an object contains two positive and negative aspects. These two aspects will determine a person's attitude in accepting, responding, appreciating, and being responsible for a particular object. Therefore, knowledge is an important domain for the formation of one's actions. Pender's theory states the importance of health promotion and prevention to be carried out to improve the health of clients or the community for a better and optimal. The researcher assumes that someone with good knowledge will have a higher understanding, which will raise awareness in him to carry out preventive measures to avoid HIV/AIDS so that they will make maximum use of health services. For those with less or sufficient knowledge, the awareness to take preventive action is also less so they do not take advantage of VCT services properly.

The knowledge factor about HIV/AIDS has a statistically significant relationship with the utilization of VCT services by MSM, and those with good knowledge have 11.2 times the chance of using VCT services compared to those with sufficient knowledge. This result is similar to the study by Fatmala, which reported a good relationship between knowledge and the use of VCT (10). Knowledge is a result of knowing and the result of sensing an object. According to Notoatmodjo (14), knowledge gained from experience will have a longer-term when compared to the knowledge obtained from the media, where individuals who have higher education will be more aware of the importance of using health services. The researcher assumes a relationship exists between enabling factors/ predisposing factors, including knowledge and the use of VCT. A higher person's knowledge will make understanding the use of health services easier. It can be seen that there is still one MSM who has sufficient knowledge but still uses VCT services.

There is a statistically significant relationship between the belief factor and the use of VCT services, and the probability of MSM who have positive beliefs is 5.3 times to use VCT services compared to those who have negative beliefs. These results are consistent with research by Mujiati, who reported that there was a significant relationship between attitudes and beliefs towards the use of health services, namely 69.0 % (20). While the availability of services, facilities, and facilities had a relationship with the utilization of VCT services. This is also in line with the 2014 research by Ilesanmi, who conducted research in Nigeria with the results that there was a relationship between the use of VCT services and HIV/AIDS prevention behaviour. Notoatmodjo (2012), treatment-seeking behaviour is the behaviour of individuals, groups, or residents to perform or seek treatment. Treatment-seeking behaviour in society, especially in developing countries, varies widely. Confidence in using services is one factor in a person's readiness to behave or act. Individual attitudes and beliefs about the availability and benefits of health services (14). The researcher assumes that the availability of health services is an essential factor in the utilization of health services. The limited schedule of VCT services and the availability of facilities and infrastructure for services are also inhibiting factors in terms of the utilization of VCT services by the MSM community. This is because community activities' hours differ from service providers. So that makes them more delaying the examination than leaving their activities.

The study shows no significant relationship between stigma and discrimination with the use of VCT services in the MSM community in Bukittinggi. Stigma related to HIV/AIDS is all unpleasant attitudes shown to those living with HIV/AIDS (PLWHA) and towards their loved ones, close colleagues, social groups, and society (21). Research conducted by

Pangaribuan in 2017 informed that of respondents with good self-stigma 45.3 % use services more than respondents with low self-stigma, and there is a relationship between self-stigma and the use of VCT services. UNAIDS defines stigma and discrimination related to HIV as negative traits assigned to a person that causes reasonable and unfair actions against that person based on their HIV status (22). The results of research conducted by Sugiharti found that there was still stigma and discrimination against Children with HIV/AIDS, both in the home, school, and healthcare facilities (21). The results of Mahajan et al. inform that stigma is still an obstacle for health services in preventing HIV/AIDS cases (23). The results of this study contradict the results of research by Pangaribuan in 2017, which informed that there was a significant relationship between stigma and discrimination with the use of VCT services in the east Sorong district (24). The researcher assumes that many other factors cause a person not to come to the service, one of which is fear of HIV laboratory test results. The risk of leakage of blood test results is also one of the barriers for someone to come to take advantage of the service. This study showed that stigma does not affect someone to take advantage of Voluntary Counseling and Testing (VCT) services.

CONCLUSION

In this study, it can be concluded that the knowledge factor about HIV/AIDS and VCT services and the confidence factor in the availability of VCT services has a statistically significant relationship with the utilization of VCT services by the MSM community in the city.

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ARTÍCULO ORIGINAL

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Phytochemical screening, stability test formulation and physical gel ethanol extract of Jatropha leaves (*Jatropha curcas L.*) as a gel compress preparation for post-ischemic stroke patients

Detección fitoquímica, formulación de pruebas de estabilidad y extracto de etanol en gel físico de hojas de Jatropha (*Jatropha curcas L.*) como preparación de compresas de gel para pacientes con accidente cerebrovascular posisquémico

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SUMMARY

Introduction: *Stroke is one of the diseases that cause death and impact serious health problems. The inflammatory response that appears in ischemic stroke will affect the progression of the stroke. This study examines the ethanol extract of Jatropha leaves (Jatropha curcas L.) as a gel compress preparation in post-ischemic stroke patients.*
Methods: *The research design was experimental with a randomized post-test only control group design. The sample was extracted with 96 % ethanol as solvent. Jatropha leaf samples (Jathropa curcas L.) were blended until smooth and weighed as much as 500 g in a 1 000 mL glass beaker. After that, 96 % ethanol was added to the procedure and poured into the extraction vessel. This study used a phytochemical screening test.*
Results: *The results of the pH test of Formula I with a concentration of 5 % were repeated three times, and the average pH was 5.03. Formulation II with 10 % concentration was repeated three times. The average pH was 5.04. Formulation III with a concentration of 15 % was repeated three times, and the average pH was 5.02. Jatropha leaf extract did not change the pH of the preparation. The results of the normality test of formulations I, II, and III had a significance value of more than 0.05, so it was said that there was no significant difference. The homogeneity results obtained a significant influence of more than 0.05, so there is no significant difference. Therefore, it was considered stable in the homogeneity parameter. While the formulation of the gel preparation stability test results was obtained organoleptic observations on all gel preparations showed that the observations before and after storage did not have significant changes.*
Conclusion: *The results of the phytochemical screening of Jatropha (Jatropha curcas L.) leaves did not contain chemical compounds of alkaloids, flavonoids, and saponins. However, it contains chemical compounds such as polyphenols and free terpenoids/steroids.*

Keywords: *Jatropha leaf extract, phytochemical screening, physical gel, stability test formulation.*

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RESUMEN

Introducción: *El ictus es una de las enfermedades que provocan la muerte y repercuten en graves problemas de salud. La respuesta inflamatoria que aparece en el ictus isquémico condicionará la progresión del ictus. Este estudio examina el extracto de etanol de las hojas de Jatropha (Jatropha curcas L.) como una preparación de compresas de gel en pacientes con accidente cerebrovascular posisquémico.*
Métodos: *El diseño de la investigación fue experimental con un diseño de grupo de control aleatorio posterior a la prueba. La muestra se extrajo con etanol al 96 % como solvente. Las muestras de hojas de Jatropha (Jathropa curcas L.) se mezclaron hasta que quedaron suaves y pesaron hasta 500 g en un vaso de precipitados de vidrio de 1 000 mL. Después de eso, se añadió etanol al 96 % al procedimiento y se vertió en el recipiente de extracción. Este estudio utilizó una prueba de detección fitoquímica.*
Resultados: *Los resultados de la prueba de pH de Fórmula I con una concentración de 5 % se repitieron tres veces, y el pH promedio fue de 5,03. La formulación II con una concentración del 10 % se repitió tres veces. El pH medio fue de 5,04. La formulación III con una concentración del 15 % se repitió tres veces y el pH medio fue de 5,02. El extracto de hoja de Jatropha no cambió el pH de la preparación. Los resultados de la prueba de normalidad de las formulaciones I, II y III tuvieron un valor de significación superior a 0,05, por lo que se dijo que no había diferencia significativa. Los resultados de homogeneidad obtuvieron una influencia significativa de más de 0,05, por lo que no existe una diferencia significativa. Por lo tanto, se consideró estable en el parámetro de homogeneidad. Mientras que la formulación de la preparación de gel, los resultados de las pruebas de estabilidad obtenidas, las observaciones organolépticas en todas las preparaciones de gel mostraron que las observaciones antes y después del almacenamiento no tuvieron cambios significativos.*
Conclusión: *Los resultados del tamizaje fitoquímico de las hojas de Jatropha (Jatropha curcas L.) no presentaron compuestos químicos de alcaloides, flavonoides y saponinas. Sin embargo, contiene compuestos químicos como polifenoles y terpenoides/esteroides libres.*

Palabras clave: *Extracto de hoja de Jatropha, cribado fitoquímico, gel físico, formulación de prueba de estabilidad.*

INTRODUCTION

Stroke is one of the biggest health problems today. Stroke is the second leading cause of death and the third leading cause of disability worldwide (1-3). Stroke sufferers attack not only old age but also the young and still productive (4,5). The World Health Organization (WHO) estimates that 70 % of strokes occur in low- and middle-income countries, accounting for 87 % of stroke-related disability deaths yearly (1). There was an increase in stroke cases by 7 % in 2013 (6) to 10.9 % in 2018 in Indonesia (7). The impact of stroke causes long-term disability, so this disease needs attention given the increasing prevalence and resulting in patient morbidity and mortality. It is also the single most common cause of disability. More than 250 000 people were living with disability due to stroke. Based on the study conducted for seven years on more than 20 000 people, 425 stroke sufferers and more than 100 000 experienced stress in their lives (8).

In stroke patients, one of the disabilities is paralysis of one side or part of the body, difficulty speaking, and experiencing emotional disturbances caused by brain damage (9-12). Commonly, stroke patients cannot do activities independently, so they need help (13). One of these conditions is caused by post-ischemic stroke inflammation. The inflammatory response that appears in post-ischemic stroke will affect stroke progression. The inflammatory response that occurs in ischemic stroke will affect the progression of the stroke (14,15). This inflammatory response can increase the course of ischemic stroke by accelerating the development of the penumbral region of tissue at risk for infarction (16,17).

Cytokines TNF-α and IL-β play a role in the inflammatory process (18-20). The high risk of disability in stroke patients is associated with increased indicators of TNF-α cytokines and IL-1β because they affect infarct expansion (19,20). The health problems above are not solely the responsibility of the government but the active participation of the community, especially families who have family members with stroke. Families are needed to improve their family health status in accordance with the maintenance function (21,22). Efforts to improve health status and prevent disability in post-stroke patients can be conducted using Jatropha leaf extract to improve temperature, infarct volume, TNF-α, and IL-1β (23-25). Making jatropha leaf gel compresses is easy, and the ingredients are

relatively widely planted as fences. Families can do this manufacture to treat family members who have a stroke. This study aims to test the ethanol extract of Jatropha leaves (*Jatropha curcas L.*) as a gel compress preparation in post-ischemic stroke patients.

METHODS

Research Design

This research was an experimental study with a randomized post-test only control group design. This method was a research procedure to reveal a causal relationship between two or more variables by controlling the influence of other variables.

Research Sample Extraction

The sample was extracted with 96 % ethanol as solvent. Jatropha leaf samples (*Jathropa curcas L.*) were blended until smooth, weighed as much as 500 g, and put into a 1 000 mL glass beaker. Then, 96 % ethanol was added to the procedure and poured into the extraction vessel. The extraction container was closed and allowed to stand for 24 hours. After 24 hours, filter the Jatropha leaf extract to obtain the filtrate on the first day. After the residual filtering of all the filtrate was finished, it was allowed to stand for 24 hours. The results of all the filtrate were combined, and then in a rotavapor with the appropriate temperature, the remaining filtrate was until it became a thick extract.

Research Sample Partition

The dried extract (*Jathropa curcas L.*) that has been obtained was weighed. Ethyl acetate was added, put into an Erlenmeyer glass, stirred with a magnetic stirrer, then centrifuged, left for a while until there was the separation of the soluble ethyl acetate and insoluble ethyl acetate layers, then removed and stored in a separate container. The insoluble acetate extract was added with ethyl acetate. Do as before until the ethyl acetate solvent was clear.

Gel Preparation

The gel preparation was applied using a gel base (carbopol 940 and hydroxy propyl methyl cellulose (HPMC) developed with 70°C distilled water in a beaker, stirred until swelled. Triethanolamine (TEA) was mixed into the base and then homogenized. Added methylparaben, which was added to the mixture. It was previously dissolved with 3 mL of distilled water at 90°C and homogenized. Next, dissolved ethanol extract of jatropha leaf (*Jatropha Curcas L.)* into glycerin, then put into the base little by little, homogenized. Then the remaining water was added. After that, it was homogenized.

Phytochemical Screening Test

A. Screening for Alkaloid Group Compounds

Identification by thin layer chromatography (TLC)

1. Extract as much as 0.3 g plus 2 mL of 96 % ethanol, stir until dissolved, then add 5 mL of HCL 2N, and heat over a water handler for 2-3 minutes, stirring the sauce.
2. After cooling, add 0.3 g of NaCl, stir well, and filter.
3. Fitrates were added with 5 mL HCl 2N. Then, filtrates were added with concentrated ammonium hydroxide (NH_4OH) until the solution became alkaline, then extracted with 5 mL of water-free chloroform in a test tube.
4. The chloroform phase (bottom) was taken with a pipette, collected, and ready for examination by TLC test.

Stationary phase: Kiesel gel GF 254

Mobile phase: Ethyl acetate: methanol: water (6:3:1)

Stain viewer: Dragendorph rectifier

If an orange color appeared, it indicated the presence of alkaloids in the extract.

B. Screening for Terpenoid Compounds

Identification by TLC

1. A little extract plus some 2 mL of n-hexane, vortexed for 3 minutes, smeared on the stationary phase
2. This thin-layer chromatography test used:

   Stationary phase: Kiesel gel GF 254

   Mobile phase: n-hexane – ethyl acetate (4: 1)

   Spot appearance: Sulfuric acid anisaldehyde

The presence of terpenoids/steroids was indicated by the occurrence of a red/purple color.

C. Screening of Flavonoid Group Compounds

1. A sample of 0.2 g was dissolved in 10 mL of 96 % ethanol using an ultrasonic vibrator.
2. Testing by thin layer chromatography method
3. The ethanol extract was spotted on the TLC plate as much as 25μL
4. This thin-layer chromatography test uses:

   Stationary phase: Kiesel gel GF 254. thin layer

   Mobile phase: $CHCI_3$: Acetone: As. Format (6:6:1)

   The appearance of stains: Ammonia vapor, UV 366 nm, and 254 nm

The presence of flavonoids was indicated by the appearance of intensive yellow colors with the appearance of ammonia vapor stains.

D. Polyphenol Screening

1. Amount of 0.3 g extract plus 10 mL of hot distilled water, stirred and allowed to come to room temperature, then added 3-4 drops of 10 % NaCl, stirred, and filtered
2. The filtrate is divided into 3 IA and IB

   Ferric chloride Test

IA is dripped with 2 % $FeCI_3$ solution. If it is blackish green, it indicates the presence of phenolic compounds

Testing using the Thin Layer Chromatography Method

1. IB is used for examination with TLC

2. This thin-layer chromatography test uses:

   Stationary phase: Kiesel gel GF 254 thin layer

   Mobile phase: ethyl acetate – methanol – Formic acid (16:4:1)

   Spot appearance: $FeCl_3$ 2 %, UV 366 nm and 254 nm

3. The presence of polyphenols is indicated by the appearance of brown to black spots with the appearance of $FeCl_3$ stains.

E. Screening of Saponin Group Compounds

Foam Test

1. A sample solution of 0.3 g is added with 10 mL of water and shaken vigorously for 30 seconds.
2. The foam test is considered positive for saponins if there is a stable foam for more than 30 min with a fruit height of 1-10 cm above the surface, and when 1 drop of 2N hydrochloric acid is added, the foam does not disappear.

   Gel Preparation Stability Test

1. Organoleptic Observations

   The organoleptic examination included shape, color, and odor, which were observed using the five senses before and after the accelerated storage treatment at 4ºC and 40ºC for 48 hours in 6 cycles.

2. Gel Preparation Stability Test

a. pH measurement

PH was measured using a pH meter before and after the accelerated storage treatment at 4°C and 40°C for 48 hours in 6 cycles.

b. Spreadability Test

   1 gram of gel was carefully placed on a glass or transparent plastic, then covered with other parts and used a weight on it with a load of 0 g, 5 g, 10 g, 20 g, 30 g, 50 g, 100 g, and 200 g. Formula 1 (5 % concentration) was repeated twice, and the diameter was measured 1 minute before and after the accelerated storage treatment at 4°C and 40°C for 48 h in 6 cycles of 1 gram of gel. Furthermore, Formula 2 (10 % concentration) was repeated twice, and the diameter was measured 1 minute before and after the accelerated storage treatment at 4°C and 40°C for 48 h in 6 cycles of 1 g of gel. And Formula 3 (15 % concentration) was

repeated twice, and the diameter was measured 1 minute before and after the accelerated storage treatment at 4°C and 40°C for 48 h in 6 cycles of 1 g of gel.

c. Homogeneity Test

As much as 1 g of the gel has been made and is smeared on the slide. Then it was bolted with another slide and seen whether the base was homogeneous and whether the surface was smooth evenly before and after the accelerated storage treatment at 4°C and 40°C for 48 h in 6 cycles.

RESULTS

The results of the phytochemical screening of Jatropha leaves (*Jathropa curcas L.*) were obtained as follows:

Results of Screening for Alkaloid Group Compounds

The appearance of an orange stain in the TLC test treated with Dragendorph reagent indicates the presence of alkaloids. Although in the picture, in samples 6-22 there is no orange stain, the sample does not contain alkaloids (Figure 1).

Notes:

Stationary phase: Kiesel gel GF 254

Mobile phase: Ethyl acetate: methanol: water

Figure 1. Stain Appearance: Dragendorph's Reagent.

Screening Results for Terpenoid/Steroid Group Compounds

A red stain in the TLC test of samples 6-22 indicates the presence of free terpenoid/steroid group compounds. In the picture, it can be seen that the sample has purple stains. The sample contains free terpenoids/steroids (Figure 2).

Notes:

Stationary phase: Kiesel gel GF 254

Mobile phase: n-heksana: etil (4:1)

Figure 2. Stain Appearance: Sulfuric Acid Anisaldehyde Reactor.

Results of Screening for Flavonoid Group Compounds

TLC Screening Results Sample 6-22

The appearance of intensive yellow stains in the TLC test indicates the presence of flavonoid compounds. Although in the picture, it can be seen that samples 6-22 did not show an intensive yellow stain, the sample did not contain flavonoids (Figure 3).

Notes:

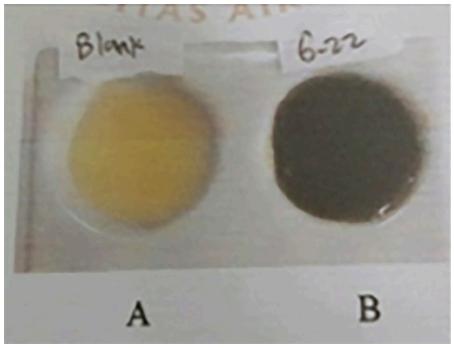
Stationary phase: Kiesel gel GF 254

Mobile phase: Butanol: Glacial acetic acid: Water (4:15)

Figure 3. Stain Viewer: Ammonia Steam, UV 366 nm & 254 nm.

Results of Screening for Compounds of Polyphenols and Tannins

Samples 6-22 appeared with dark blue-green stains after being dropped with 2 % $FeCl_3$ solution, so samples 6-22 showed polyphenols (Figure 4).



Notes:

A:IA(Blanko) solution

B: IA + FeCl3 2 % solution

Figure 4. A dan B Solutions.

TLC test

The appearance of brown to black spots on the TLC test indicates the presence of polyphenol group compounds. Although in the picture, samples 6-22 showed blackish stains, the samples contained polyphenols (Figure 5).

Notes:

Stationary phase: Kiesel gel GF 254

Mobile phase: ethyl acetate: methanol: formic acid (16:4:1)

Figure 5. Stain Viewer: $FeCl_3$ 2 %, UV 366 nm & 254 nm Reactor.

Results of Screening for Saponin Group Compounds

The solution produces foam that lasts more than 30 minutes on the foam test, indicating the presence of saponin group compounds. The figure shows that the sample solution 6-22 does not produce foam that lasts more than 30 minutes (Figure 6).

Phytochemical screening of Jatropha leaves (*Jathropa Curcas L.*) showed that the samples contained terpenoids/steroids and polyphenols but did not contain flavonoids, saponins, and alkaloids. Tables 1-4 showed formulas I, II, and III based on organoleptic observations, pH test results, normality test, and homogeneity test. The formulation test and physical stability test of Jatropha leaf extract gel (*Jathropa curcas L.*) were as follows:

Figure 6. Saponin Group Compound Sample Solution.

In Table 1 it can be seen that the results of organoleptic observations showed that the ethanol extract of Jatropha Curcas (*Jatropha curcas L.*) leaves with HPMC base in each formula had the same organoleptic, which had a semi-solid form and was easy to apply with a dark green color with a distinctive aromatic smell. The addition of concentration in the formula did not affect the gel preparation organoleptically in shape, color, or smell. This statement can also be seen in Figure 6 below.

Table 1

Organoleptic Observations

Preparation	Form	Colour	Scent
Formula I	Semi-solid	Dark green	Special Extract
Formula II	Semi-solid	Dark green	Special Extract
Formula III	Semi-solid	Dark green	Special Extract

Information: Formula I: Concentration 5 %, Formula II: Concentration 10 %, Formula III: Concentration 15 %

Table 2 shows the gel pH test results for each formula. Starting from the results of pH testing on the base formula, which is controlled so that it does not contain extract, replication 1 is worth 5.04, replication 2 is 5.05, and replication 3 is 5.07, with an average of 5.05 and SD ± 0.01. The pH test results on formula 1, which contains extracts with a concentration of 5 %, replication 1 worth 5.02, replication 2 worth 5.06, replication 3 worth 5.01, with an average of 5.03 and SD ± 0.02. The pH test results on formula 2, which contains extracts with a concentration of 10 %, replication 1 worth 5.00, replication 2 worth 5.05, replication 3 worth 5.07, with an average of 5.04 and SD ± 0.03. The results of the pH test on formula 3 contained an extract with a concentration of 15 %, 1 replication 5.01, 2 replications 5.05, and 3 replications 5.02, with an average of 5.02 and SD ± 0.02.

Table 2

pH Test Results

Formula	pH			
	Replication n1	Replication n2	Replication n3	Average ± SD
Basis	5.04	5.05	5.07	5.0533 ± 0.0153
Formula 1	5.02	5.06	5.01	5.0300 ± 0.0265
Formula 2	5.00	5.05	5.07	5.0400 ± 0.0361
Formula 3	5.01	5.05	5.02	5.0267 ± 0.0208

From Table 3, the pH data normality test using Shapiro-Wilk was carried out on the basis group with a significant value of 0.637, the formula I group with a significant value of 0.363, the formula II group with a significant value of 0.537 and the formula III group with a significant value of 0.463. This shows that the normality test conducted on all groups shows a significant value >0.05, which means that the distribution of values between all groups shows a normal distribution because there is no significant difference in the base group, formula I group, formula II group, and formula III group. So the next analysis is continued with parametric.

Table 3

Tests of Normality

	Formula	Kolmogorov-Smirnova Statistic	df	Sig.	Shapiro-Wilk Statistic	Df	Sig.
pH	Basis	0.253	3	.	0.964	3	0.637
	F1	0.314	3	.	0.893	3	0.363
	F2	0.276	3	.	0.942	3	0.537
	F3	0.292	3	.	0.923	3	0.463

a. Lilliefors Significance Correction

From Table 4, the homogeneity test was carried out on the basis group with a significant value of 0.380, the formula I group with a significant value of 0.840, the formula II group with a significant value of 0.840 and the formula III group with a significant value of 0.415. This shows that the homogeneity test conducted on all groups shows a significant value > 0.05, which means that the distribution of values between all groups shows a homogeneous distribution of values because it does not show significant differences, so it is considered stable in the homogeneity parameter, both before and after storage. So, the next analysis is continued with parametric.

Table 4

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
pH	Based on Mean	1.169	3	8	0.380
	Based on Median	0.278	3	8	0.840
	Based on the Median and with adjusted df	0.278	3	6.000	0.840
	Based on trimmed mean	1.068	3	8	0.415

From Table 5, to determine the stability of pH, One Way ANOVA test was carried out on all groups showing a significant value of 0.607 > 0.05 which means that there is no difference between the four groups, namely the base group, the formula group I, the formula group II and the formula group III. So that it can be interpreted that the pH of the gel preparation of Jatropha leaf extract (*Jatropha curcas L.*) for compresses is in a stable condition. Based on the tables above, castor leaf extract did not change the pH of the preparation. In addition, the pH value of all preparations did not differ by about 5 (Table 5).

Table 5

One-Way ANOVA Test
pH

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.001	3	0.000	0.646	0.607
Within Groups	0.005	8	0.001		
Total	0.007	11			

Spreadability Test Results

Based on tables 6-9 and Figures 7-9 showed the test results related to formulas 1-3.

Based on Table 6 the results of the dispersion test can be seen in formula 1 replication 1 with a concentration of 5 % without being given a load that is to produce a dispersion of 1 cm, given a load of 5 g which produces a dispersion of 1.4 cm, given a load of 10 g which produces a dispersion of 1.5 cm, given a load of 20 g which produces a spread power of 1.8 cm, is given a load of 30 which produces a scattering power of 2 cm, is given a load of 50 which produces a scattering power of 2.2 cm, is given a load of 100 g which produces a scattering power of 2.3 cm, and is given a load of 200 g which produces power spread 2.4 cm. The results of the dispersion test in formula 1 replication 2 with a concentration of 5 % without being given a load that is to produce a spread power of 1.5 cm, given a load of 5 g which produces a spread of 1.7 cm, given a load of 10 g which produces a dispersion power of 1.8 cm, given a load of 20 g, namely produces a spread of 1.9 cm, is given a load of 30 which produces a scattering power of 2.1 cm, is given a load of 50 which produces a scattering power of 2.4 cm, is given a load of 100 g which produces a scattering power of 2.7 cm, and is given a load of 200 g which produces a scattering power of

2.7 cm. In Table 6 it can be seen that replication 2 with a load of 100 g and 200 g had a good dispersion of 2.7 cm.

Table 6

Formula 1

Weight (g)	Spread Diameter F1-1 (cm)	Spread Diameter F1-2 (cm)
0	1	1.5
5	1.4	1.7
10	1.5	1.8
20	1.8	1.9
30	2	2.1
50	2.2	2.4
100	2.3	2.7
200	2.4	2.7

Based on the equation of the regression line, the dispersive power test profile is shown in Figure 7. From the test results on the dispersion of the gel, it was found that the equation for the dispersion power was obtained, namely in RI, it was obtained y = 0.0114 cm/g + 1.3935, and at R2, it was obtained y = 0.0115 cm/g + 1.6601. This means that the increasing load is directly proportional to the diameter of the spread power. The graph shows the Slope R1 value = 0.0114 cm/g and the Slope R2 value = 0.0115 cm/g. It can be explained that the average increase of one gram of load can increase the dispersion diameter of 0.0114 in formula 1 R1 while the average increase of 1 gram of load can increase the dispersion diameter of 0.0115 in formula 1 R2.

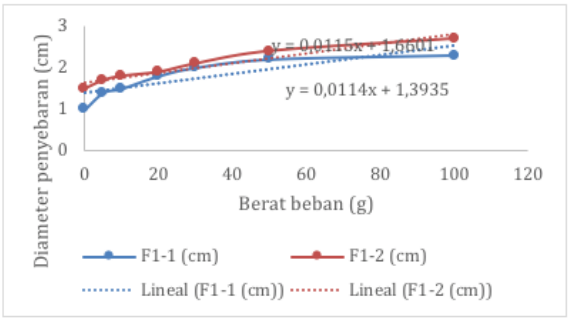


Figure 7. Graph of the relationship between the weight of the load and the diameter of the dispersion of Formula 1.

Based on Table 7 the results of the dispersion test can be seen in formula 2 replication 1 with a concentration of 10 % without being given a load, which produces a spread power of 1.2 cm, given a load of 5 g, which produces a dispersion of 1.4 cm, given a load of 10 g, which produces a dispersion of 1.5 cm, given a load of 20 g which produces a scattering power of 1.6 cm, is given a load of 30 which produces a scattering power of 1.7 cm, is given a load of 50 which produces a scattering power of 1.9 cm, is given a load of 100 g which produces a scattering power of 2.1 cm, and is given a load of 200 g which produces power spread 2.3 cm. The results of the dispersion test in formula 2 replication 2 with a concentration of 10 % without being given a load that is producing a spread power of 1.2 cm, given a load of 5 g which produces a spread of 1.3 cm, given a load of 10 g which produces a spread of 1.4 cm, given a load of 20 g, namely produces a spread of 1.6 cm, is given a load of 30 which produces a scattering power of 1.9 cm, is given a load of 50 which produces a scattering power of 2.1 cm, is given a load of 100 g which produces a scattering power of 2.2 cm, and is given a load of 200 g which produces a scattering power of 2.2 cm. Table 7 shows replication 2 with a load of 100 g and 200 g had a good dispersion of 2.2 cm.

Table 7

Formula 2

Weight (g)	Spread Diameter F2-1 (cm)	Spread Diameter F2-2 (cm)
0	1.2	1.2
5	1.4	1.3
10	1.5	1.4
20	1.6	1.6
30	1.7	1.9
50	1.9	2.1
100	2.1	2.2
200	2.3	2.2

Based on the regression line equation, the dispersion test profile is shown in Figure 8. From the test results, the dispersion power of the gel obtained the equation of dispersion power, namely in RI obtained y = 0.0082 cm/g + 1.3775

and at R2 obtained y = 0.0103 cm/g + 1.3562. This means that the increase in load is directly proportional to the diameter of the spreading power. The graph shows the slope value of R1 = 0.0082 cm/g and the slope value of R2 = 0.0103 cm/g. It can be explained that an average increase of one gram of load can increase the dispersion diameter by 0.0082 cm/g in formula 1 R1 while an average increase of 1 gram of load can increase the dispersion diameter by 0.0103 cm/g in formula 1 R2.

Slope R1 = 0.0082, Slope R2 = 0.0103.

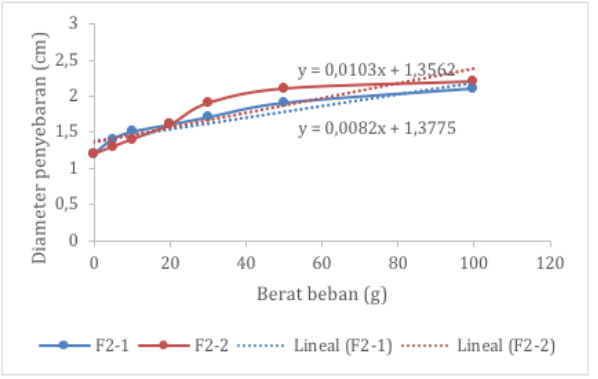


Figure 8. Graph of the relationship between the weight of the load and the diameter of the dispersion Formula 2.

Based on Table 8, the results of the dispersion test can be seen in formula 3 replication 1 with a concentration of 15 % without being given a load that produces a dispersion power of 0.9 cm, is given a load of 5 g which produces a dispersion of 1.3 cm, is given a load of 10 g which produces a spread of 1.4 cm, given a load of 20 g which produces a scattering power of 1.7 cm, is given a load of 30 which produces a scattering power of 1.9 cm, is given a load of 50 which produces a scattering power of 2.2 cm, is given a load of 100 g which produces a scattering power of 2.3 cm, and is given a load of 200 g which produces power spread 2.4 cm. The results of the dispersion test in formula 3 replication 2 with a concentration of 15 % without being given a load that is producing a spread power of 1.1 cm, given a load of 5 g which produces a spread of 1.4 cm, given a load of 10 g which produces a dispersion of 1.5 cm, given a load of 20 g, namely produces dispersion of 1.6 cm, is given a load of 30 which produces a scattering power of 1.8 cm, is given a load of 50 which produces a scattering power of 1.9 cm, is given a load of 100 g, which produces a scattering power of 2.0 cm, and is given a load of 200 g, which produces a scattering power of 2.2 cm. Table 8 shows that replication 2 with a load of 200 g had a good dispersion of 2.2 cm.

Table 8

Formula 3

Weight (g)	Spread Diameter F3-1	Spread Diameter F3-2
0	0.9	1.1
5	1.3	1.4
10	1.4	1.5
20	1.7	1.6
30	1.9	1.8
50	2.2	1.9
100	2.3	2.0
200	2.4	2.2

Based on the regression line equation, the scatter power test profile is shown in Figure 9. From the results of the gel dispersibility test, the dispersion power equation was obtained, namely in RI, it was obtained y = 0.0076 cm/g + 1.3797, and at R2, it was obtained y = 0.0126 cm/g + 1.2849. This means that the increase in load is directly proportional to the diameter of the spreading power. The graph shows the slope value of R1 = 0.0076 cm/g and the slope value of R2 = 0.0103 cm/g. It can be explained that an average increase of one gram of load can increase the dispersion diameter by 0.0076 cm/g in formula 1 R1 while an average increase of 1 gram of load can increase the dispersion diameter by 0.0126 cm/g in formula 1 R2.

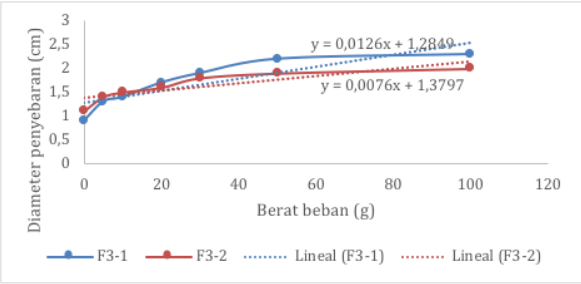


Figure 9. Graph of the relationship between the weight of the load and the diameter of the dispersion Formula 3.

Based on Table 9, the results of the dispersion test can be seen in formula 1 with a concentration of 5 % in replication 1 and replication 2 with a load of 100 g the average value of dispersion is 2.50±0.20. In formula 2 with a concentration of 10 % in replication 1 and replication 2 with a load of 100 g the average dispersion value was 2.15±0.05. In formula 3 with a concentration of 15 % in replication 1 and replication 2 with a load of 100 g the average dispersion value was 2.15±0.15.

Table 9

Formula 1-3

Formula	Spreadability Capacity on Load 100 g (cm)			Spreadability/Slope (cm/g)		
	R1	R2	Rerata	R1	R2	Rerta
F1	2.3	2.7	2.50±0.20	0.0114	0.0115	0.0114±0.0000
F2	2.1	2.2	2.15±0.05	0.0082	0.0103	0.0092±0.0010
F3	2.3	2.0	2.15±0.15	0.0126	0.0076	0.0101±0.0025

DISCUSSION

Phytochemical Screening

A phytochemical test was carried out as a qualitative preliminary test to determine the content of chemical compounds (secondary metabolites) in Jatropha (*Jatropha curcas L.*) leaves. Phytochemically tested ingredients in Jatropha (*Jatropha curcas L.*) leaves are alkaloids, flavonoids, saponins, steroids, terpenoids, phenols, and tannins (27). The results of the study (27) showed that the compounds contained in Jatropha leaf extract (*Jatropha curcas L.*), namely the positive (+) dry leaf test contained alkaloids and steroids. The positive (+) wet leaves contain alkaloids, steroids, and saponins. The compound is obtained from the extraction using methanol solvent and then tested with the reagents that have been determined.

In the results of the study, phytochemical screening showed that the content in *Jatropha curcas L.* leaves was polyphenols and terpenoids/free steroids but did not contain alkaloids, flavonoids, and saponins. This is contrary to the results of research (30) which showed that the results of the qualitative test of the class of compounds contained in the ethanol extract of *Jatropha* leaves by TLC showed that they contained flavonoids, tannins, and saponins. This situation is due to the different ethanol extracts.

The benefits of polyphenol content as antioxidant compounds that can minimize the risk of chronic disease, high levels of oxidants in the body neutralize free and harmful free radicals so that they can protect against oxidative stress. Besides being able to function as antioxidants, polyphenols have other benefits for the body, namely preventing anti-aging, being an anti-cancer, preventing the body from obesity, and increasing immunity and as an anti-inflammatory (28). And the content of free terpenoids/steroids has properties and the ability to protect humans from various diseases such as anticancer, antimicrobial, antioxidant, antithrombotic, boosting the immune system, anti-inflammatory, regulating blood pressure, lowering cholesterol, preventing heart disease, preventing vision problems, and regulate blood

sugar levels, menstrual disorders, skin disorders, liver damage and malaria (triterpenoids) (29).

Based on the results of research through phytochemical tests and supported by other studies that the content of compounds in Jatropha leaf extract (*Jatropha curcas L.*) can be used as alternative medicine or traditional medicine that is easily obtained around the home environment and one of them can reduce fever/anti-inflammatory. -inflammation whose utilization can be used as a compress.

Gel Physical Properties Test

In the study, it was found that organoleptic observations on all gel preparations showed that the observations before and after storage did not have a change, namely with a dark green color, a semi-solid form that was easy to apply, and the characteristic odor of the extract and the clear and transparent color appeared, this indicates that the observations in this parameter are said to be stable. Both before and after storage or the components in the preparation during storage do not experience a reaction between one material and another, so there are no signs of reaction from changes in color, appearance, shape, and odor.

This is in line with research (26). The results of organoleptic observations showed no significant changes. For color, odor, and color, it remains transparent as well as for the characteristic odor of carbopol and Na CMC which is getting weaker. The most influential factor in the change in color and odor is probably the temperature difference between the room temperature, refrigerator, and oven. For organoleptic observations, Jatropha (*Jatropha curcas L.*) leaves can be recommended as a compress because the texture is semi-solid, soft, and easy to apply on the skin and the color is dark green and refreshing and has a distinctive aroma.

pH or potential of hydrogen is the degree of acidity used to express the level of acidity or alkalinity of everything, including the skin. The pH level has a magnitude in the numbers 1-14. A solution is neutral at pH 7, if it is below 7 it is acidic and if it is above 7 it is basic. The pH of the body's skin is regulated by the sebaceous and sudoriferous glands, which secrete sebum to maintain skin elasticity and health. In the study, it was found that the pH test value of all preparations did not differ in the results, namely pH = 5. This is in accordance with research (26) showing the skin pH range at pH 5 is still safe to use. The pH of the preparation is very influential on the skin because if the pH of the gel is too acidic, irritation will occur on the skin, otherwise, if the pH is too alkaline it will cause dry scaly skin, another factor is the sensitivity of human skin which is different.

In the observational study of the normality test of Formulation I, Formulation II, and Formulation III, the significance value of the results showed no significant difference. So that the next analysis is carried out with parametric. This is in line with research (30). The normality test of the data according to Shapiro Wilk shows that the data is normally distributed.

The results of the homogeneity observation study showed that there was no significant difference, so it was considered stable in the homogeneity parameter, both before and after storage. This is based on the results obtained that there are no solid particles contained in the gel and the absence of gelling agents that are still clumping or uneven in the preparation. This is in line with research (26). The homogeneity test showed that all gel preparations showed good homogeneity, this was indicated when a number of gels were applied to a piece of glass, a homogeneous arrangement and no coarse grains were seen, meaning that it can be stated physically stable. So, when applied to the skin does not cause irritation. An important factor that needs to be considered in this test is when the gel is made by adding the ingredients little by little and sequentially.

Based on this, the formulation of a compress gel preparation of Jatropha leaf extract (*Jatropha curcas L.*) with ethanol solvent with different concentrations can be used as an alternative medicine/traditional medicine as a compress to reduce fever/anti-inflammatory.

The dispersion test of the preparation was carried out to determine the amount of force required for the gel to spread on the skin or to determine the ability to spread the gel preparation when applied to the skin. The results of the dispersion test of Formula I are easier to spread than Formula 2 and Formula 3.

This shows that in line with research (26) the two formulas have dispersion values that vary/ do not spread easily because they are influenced by changes in temperature so the dispersion values obtained to change. The possibility of spreading is small because after leaving the oven or refrigerator the temperature is not allowed to be at room temperature, which is ideally left to stand for 4 - 6 hours. This is also due to the use of a gelling agent with a high concentration so that the dispersion is small.

An ischemic stroke, caused by a decrease in cerebral blood flow, will result in a decrease in blood flow in the penumbra area, which in turn will result in complex cascades such as excitotoxicity and oxidative stress in the ischemic neuron area. This cascade activates microglia and releases proinflammatory cytokines such as TNF-α, IL-1β, and IL6. These cytokines have the potential to induce an inflammatory reaction by recruiting and infiltrating neutrophils, monocytes, and T cells to the lesion site. In the infarct core area, cells die (necrosis) and will release damage-associated molecule patterns (DAMPs), which will then be detected by immune cells such as natural killer (NK) cells (1). So, in the study, Jatropha leaf extract (*Jathropa curcas L.*) was formulated into a compress gel preparation because this dosage form is easy to use and spreads on the skin faster. In addition, the gel has soothing, moisturizing properties and easily penetrates the skin so that it provides a healing effect and is very effective in compressing Jatropha leaf extract (*Jathropa curcas L.*) in ischemic stroke patients with inflammation and inflammation due to the content in Jatropha leaves (*Jathropa curcas L.*) contains polyphenols and free terpenoids/ steroids. The benefits of polyphenol content as antioxidant compounds can minimize the risk of chronic disease. High levels of oxidants in the body neutralize harmful and free radicals so that they can protect against oxidative stress. Besides being able to function as antioxidants, polyphenols have other benefits for the body, namely preventing anti-ageing, an anticancer, preventing the body from obesity, and increasing immunity and anti-inflammatory. The content is free of terpenoids/steroids. It has properties and the ability to protect humans from various diseases such as anticancer, antimicrobial, antioxidant, and antithrombotic, boosting the immune system, anti-inflammatory, regulating blood pressure, lowering cholesterol, preventing heart disease, preventing vision problems, and regulating blood sugar levels, menstrual disorders, skin disorders, liver damage and malaria (triterpenoids). The basic contribution to the field of nursing is that the results of this study can be used as one of the nursing interventions of appropriate technology in the health sector to provide health services for the recovery of stroke patients. Ischemic because giving jatropha leaf extract gel compresses can prevent the expansion of the infarct so that the stroke patient does not have a re-attack that becomes more severe and eventually causes disability.

CONCLUSION

The phytochemical screening of Jatropha leaf extract showed that the sample contained terpenoid/steroid compounds and polyphenols but did not contain flavonoid, saponin, and alkaloid compounds. Formulation test and physical stability test of Jatropha leaf extract gel (*Jathropa curcas L.*) based on organoleptic observations of all the formula preparations in semi-solid form, dark green color, and characteristic odor of the extract. The study's results recommend further research on gel compresses in experimental animals and post-ischemic stroke patients. The use of jatropha leaves in treating fever has not been maximized, because its use is less practical if it has to be prepared and given directly in the form of leaf sheets. Therefore, it is necessary to develop a formula that can facilitate its use, such as a compressed gel. This dosage form is easier to use and spreads on the skin more quickly.

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The influence of religious coping on family resilience in communicating and solving problems during the COVID-19 pandemic

La influencia del afrontamiento religioso en la resiliencia familiar para comunicarse y resolver problemas durante la pandemia de COVID-19

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SUMMARY

Introduction: *Religious coping has a crucial role in overcoming difficult problems in the family. This study aimed to analyze the influence of religious coping on family resilience in communicating and solving problems during the COVID-19 pandemic.*
Methods: *The research design used was descriptive with a cross-sectional survey approach. A total of 242 respondents in East Java Province, Indonesia, were the respondents in this study. Data collection by questionnaire. Data analysis used binary logistic regression and multivariate logistic regression. The degree of freedom used is 95 %, with a p-value of less than 0.05.*
Results: *Religious coping and work affect family resilience in communication and problem-solving. The most dominant influence of work factors (OR=1.924; 95 % CI=1.068–3.465) means that working people were two times more likely to have family resilience in communicating and solving problems than families who do not work. In addition, families with adequate religious coping will have a 1-time opportunity to have resilience in communication and problem-solving compared to families with inadequate religious coping (OR=1.131; 95 % CI=1.077–1.188).*
Conclusion: *Work and religious coping factors strongly influence family resilience in communication and problem-solving. Strengthening the community with a religious approach is needed to support the family's line of defense against this pandemic condition.*

Keywords: *Communication, COVID-19, problem solve, religious coping, resilience.*

RESUMEN

Introducción: *El afrontamiento religioso tiene un papel crucial en la superación de problemas difíciles en la familia. Este estudio tuvo como objetivo analizar la*

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influencia del afrontamiento religioso en la resiliencia familiar para comunicarse y resolver problemas durante la pandemia de COVID-19.
Métodos: *El diseño de investigación utilizado fue descriptivo con un enfoque de encuesta transversal. Un total de 242 encuestados en la provincia de Java Oriental, Indonesia, fueron los encuestados en este estudio. Recogida de datos mediante cuestionario. El análisis de datos utilizó regresión logística binaria y regresión logística multivariada. El grado de libertad utilizado es del 95 %, con un valor de p menor de 0,05.*
Resultados: *El afrontamiento y el trabajo religioso afectan la resiliencia familiar en la comunicación y resolución de problemas. La influencia más dominante de los factores laborales (OR=1,924; IC 95 %=1,068–3,465) significa que las personas que trabajan tenían dos veces más probabilidades de tener resiliencia familiar para comunicarse y resolver problemas que las familias que no trabajan. Además, las familias con un afrontamiento religioso adecuado tendrán una oportunidad única de tener resiliencia en la comunicación y la resolución de problemas en comparación con las familias con un afrontamiento religioso inadecuado (OR=1,131; IC del 95 %=1,077–1,188).*
Conclusión: *Los factores de afrontamiento laborales y religiosos influyen fuertemente en la resiliencia familiar en la comunicación y resolución de problemas. Es necesario fortalecer la comunidad con un enfoque religioso para apoyar la línea de defensa de la familia frente a esta condición pandémica.*

Palabras clave: *Comunicación, COVID-19, resolución de problemas, afrontamiento religioso, resiliencia.*

INTRODUCTION

Religious coping is an adaptive coping strategy mechanism that involves individual faith when faced with problems (1), managing problem situations by praying (2), by surrendering completely to God's will so that his hopes can adapt to the situation that occurs(3). Coping religiosity has a strategic influence on stabilizing family resilience as a form of managing public health crises due to the COVID-19 pandemic such as job loss, lack of social support, and mental health problems due to domestic violence (4-6). Stress conditions are also caused by headlines dominated by news about COVID-19 (7-11). Responding to this situation requires preparedness and critical response, effective communication, and being proactive, polite, imaginative, innovative, creative, and professional as a problem-solving strategy (12,13). A positive outlook involving effective communication can manage mental health (14), as well as problem-solving to become a buffer in managing family resilience and involve religious coping support when dealing with difficult problems during this COVID-19 pandemic (15,16).

The COVID-19 pandemic has caused a public health crisis, which is a serious problem because it can threaten family resilience (17-19). A pandemic causes conflict in family problems. Families are expected to focus on solving problems related to joint problem-solving by building harmonious relationships and positive communication in the family (20). Problems of family tension regarding the pandemic are emerging in developing countries (21), especially in low- and middle-income countries (22). COVID-19 attacks various sectors indiscriminately, thus requiring residents to practice social and physical distancing (23).

The prevalence of problems related to family resilience includes psychological stress at a moderate level (30.6 %) and severe level (11.5 %), moderate level of financial problems (36.6 %) and poor level (40 %), moderate level of mental health problems (24.4 %), and severe level (21.5 %), moderate level family violence problems (4 %) and severe level (53 %), family members have addiction due to drug abuse (21.5 %) and decreased by (15.4 %) (24).

The problem of religious coping depends on each individual interpreting a problem. Individuals with high levels of religiosity and spirituality tend to easily interpret events during the COVID-19 pandemic with a positive view (25). During the COVID-19 pandemic, people's religiosity and spirituality increased by around 30 % (26). Religious coping can create a sense of security and peace-related to getting closer to submitting to pray to the creator to ask for protection or safety (27).

Religious coping is very effective if it is used to manage family resilience when experiencing a threat of problems, involving adaptive coping responses to manage problems (28). The health crisis in the community is influenced by many factors, one of which is a negative view, causing

poor communication and problem-solving. This causes a decrease in social support, leading to social isolation and social discrimination (29). The use of adaptive coping can have a positive impact on family resilience (30). This study aimed to analyze the influence of religious coping on family resilience in communicating and solving problems during the COVID-19 pandemic.

METHODS

Design and participants

The research design used descriptive with a cross-sectional survey approach. The research will be conducted in 2021-2022. The research sample was Indonesian citizens in Malang Regency, East Java Province, Indonesia, with a sample size determined by G Power version 3.1 with z test, logistic regression, odds ratio 1.5, power of 80 %, and probability error of 0.05, obtained a sample size of 243 respondents. Sampling was done by non-probability sampling with an accidental sampling technique.

Variables and Instruments

The main independent variable is religious coping. There are 9 items of questionnaire questions with a score range of 1-4 (1=rarely done to 4=often done). Some questions are as follows; "How often do you do individual prayers?, How often do you go to a mosque or place of worship to worship?". The minimum and maximum scores for this questionnaire are 9–36. Furthermore, they are categorized into 2, namely good (>median) and poor (<median). In addition to the main variable, there are also other independent variables, including age, education, family type, income, occupation, and religious coping. Age was categorized into 6 categories (1=17–25 years; 2=26–35 years; 3=36–45 years; 4=46–55 years; 5=56–65 years; 6=>65 years). Education includes 0=no school; 1=elementary school; 2=junior high school; 3=senior high school; 4=college. Family types are divided into nuclear family=1; extended family=2; and single parent = 3. Income is divided into 2: less than 3 million1; more than 3 million =2. Profession (Unemployed=1 and employed=2). The dependent variable of this research is family resilience in communication and problem-solving. There are 27 question items, including flexibility, contribution, openness, honesty, freedom to express feelings, sharing responsibilities, and others (Table 2). The questionnaire uses a Likert scale of 1-4 (1=disagree; 4=strongly agree). The composite score is between 12–108. Furthermore, it is categorized into 2, namely adequate (>median) and inadequate (<median).

Procedure

The researcher designed the survey as an electronic questionnaire using a google form. Participants will get a link from the electronic survey. Preparation takes 30 minutes to fill out the questionnaire. To increase participation, incentives were given to participants after filling out the questionnaire.

Data analysis

All data were analyzed using Statistical Package for Social Science (SPSS) version 21 software (IBM USA). Descriptive analysis was used to identify religious coping, age, age, education, family type, income, occupation, and family resilience with frequency and percentage. Logistic binary analysis was used to select candidate variables. Variables with $p < 0.25$) were included in the modeling. Finally, multivariate analysis was used to analyze the effect of candidate variables on family resilience in communicating and solving problems during the COVID-19 pandemic. The degree of freedom used is 95 %, with a $p<0.05$.

Ethical considerations

This study received ethical approval from the Health Research Ethics Commission of the Universitas Muhammadiyah Malang with protocol number E.5.a/007/KEPK-UMM/I/2022. Participants provided written consent for participation before data collection.

RESULTS

Most of the respondents' age ranged from 46 to 55 years, as much as 30.9 %, with the last education level of the majority being senior high school, as much as 47.7 %. Meanwhile, the type of family is dominated by the nuclear family by 66.7 %. Most respondents earn less than 3 million rupiahs (90.5 %), while 33.3 % are working citizens. The data collected also shows that more than half of the respondents have good religious coping, which is 58.4 %, and adequate family resilience in communication and problem-solving (51.9 %) (Table 1).

Table 1

Characteristics of Respondents (n=243)

Characteristics	n	Percentage (%)
Age		
17-25	19	7.8
26-35	57	23.5
36-45	56	23.0
46-55	75	30.9
56-65	27	11.1
>65	9	3.7
Education		
No School	1	0.4
Elementary School	46	18.9
Junior High School	55	22.6
Senior High School	116	47.7
College	25	10.3
Family Type		
Nuclear Family	162	66.7
Extended Family	60	24.7
Single Parent	21	8.6
Income		
<3 Million	220	90.5
>3 Million	23	9.5
Profession		
Employed	81	33.3
Unemployed	162	66.7
Religious Coping		
Poor	101	41.6
Good	142	58.4
Communication Resilience		
Inadequate	117	48.1
Adequate	126	51.9

Table 2 shows the range of scores on the family resilience questionnaire in communication and problem solving is 56 %-85.6 %. Community members stated that 56 % were able to adapt to the demands experienced by their families, and 85.6 % felt happy spending time and energy with their families during the COVID-19 pandemic.

Religious coping and work affect family resilience in communication and problem-solving. The most dominant influence of work factors (OR: 1.924; 95 % CI: 1.068 – 3,465) means that people who work are two times more likely to have family resilience in communicating and solving problems than families who do not work. In addition, families with adequate religious coping will have 1 time chance of having resilience in communication and problem-solving compared to families with inadequate religious coping (OR: 1.131; 95 % CI: 1.077 – 1.188) (Table 3).

DISCUSSION

The results showed that religious coping was proven effective in increasing family resilience. This is in line with previous studies which state that positive religious coping protects against negative behaviour (31,32). Although the frequency of religious behaviour is related to anxiety about COVID-19, this anxiety is influenced by the background of religious beliefs and increased stress so individuals increase their prayer and religious meditation to manage their anxiety (33).

COVID-19 has a serious impact that can lead to death. This affects the family's mental health, such as anxiety, fear, depression, and stress, so families practice religion as a source of peace of mind (17,34). In addition, religious coping can affect family psychological factors in dealing with difficult situations, so religious coping can be called a form of support in strengthening family mentality (35).

Religious coping closely relates to communication, including consistency in communication, open emotional expression in communication, and collaborative problem-solving (36-38). Using positive coping skills such as communication strategies and problem-solving skills in positive

Table 2

Scores of The Family Resilience Questionnaire in Communication and Problem Solving

	1	2	3	4
Flexibility	6/2.5 %	15/6.2 %	54/22.2 %	168/69.1 %
Contribution	3/1.2 %	18/7.4 %	52/21.4 %	170/70 %
Overcoming pain	5/2.1 %	20/8.2 %	46/18.9 %	172/70.8 %
Fulfillment of hope	9/3.7 %	32/13.2 %	66/27.2 %	136/56 %
Openness	8/3.3 %	16/6.6 %	52/21.4 %	167/68.7 %
Understanding	4/1.6 %	9/3.7 %	39/16 %	191/78.6 %
Clarification	4/1.6 %	11/4.5 %	40/16.5 %	188/77.4 %
Honesty	5/2.1 %	7/2.9 %	29/11.9 %	202/83.1 %
Free to express feelings	13/5.3 %	15/6.2 %	59/24.3 %	156/64.2 %
Discuss	4/1.6 %	5/2.1 %	41/16.9 %	193/79.4 %
Accept the difference	7/2.9 %	5/2.1 %	47/19.3 %	184/75.4 %
Clarification	3/1.2 %	8/3.3 %	49/20.2 %	183/75.3 %
Free opinion	4/1.6 %	4/1.6 %	53/21.8 %	182/74.9 %
Overcoming difficulties	5/2.1 %	12/4.9 %	63/25.9 %	163/67.1 %
Consultation on decisions	4/1.6 %	7/2.9 %	40/16.5 %	192/79 %
Problem-solving	2/0.8 %	3/1.2 %	31/12.8 %	207/85.2 %
Find a solution	2/0.8 %	5/2.1 %	52/21.4 %	184/75.7 %
Achieved decision	3/1.2 %	8/3.3 %	46/18.9 %	186/76.5 %
Feeling happy	5/2.1 %	8/3.3 %	22/9.1 %	208/85.6 %
Learn from experience	4/1.6 %	6/2.5 %	37/15.2 %	196/80.7 %
Commitment	4/1.8 %	5/2.1 %	44/18.1 %	190/78.2 %
Share responsibility	5/2.1 %	7/2.9 %	47/19.3 %	184/75.7 %
Attention	3/1.2 %	3/1.2 %	37/15.2 %	200/82.3 %
Using the new way	3/1.2 %	11/4.5 %	60/24.7 %	169/69.5 %
How to talk	3/1.2 %	5/2.1 %	43/17.7 %	192/79 %
Safe assurance	4/1.6 %	5/2.1 %	33/13.6 %	201/82.7 %

Relative frequency of family resilience questionnaire item scores in communication and problem-solving. The score ranges from 1 (not done) to 4 (often done).

Table 3

The Final Multivariate Logistic Regression Model of Family Resilience in Communication and Problem Solving

Variable	B	SE	Wald	p-value	OR	95 % CI for Exp (B)	
						Lower	Upper
Religious Coping	0.123	0.025	24 240	0.0001	1,131	1.077	1.188
Profession	0.654	0.300	4 750	0.029	1,924	1.068	3.465
Constant	-7.578	1.456	27 069	0.000	0.001		

Selection of candidates who entered the model were religious coping, education, and work with p value < 0.25. Respectively 0.0001, 0.131, 0.057, while the variables were not included in the model because they had a p value> 0.25, namely age (p: 0.298), family type (p:0.935), income (p:0.824).

religious coping has significant results as a new psychological intervention for society, especially during the current pandemic such as religious counseling and spirituality (39-41). Based on the explanation above, it can be said that religious coping can help individuals and families in finding problems through positive thinking, good communication, and mental support.

The results of this study indicate that work has an influence on family resilience during the COVID-19 pandemic. The influence of work greatly influences managing family resilience (42). During the COVID-19 pandemic, there were many layoffs, and this had an impact on the income in the family which drastically decreased, causing a resilience crisis (43-45). Losing a job and lowering income are major stress causes for families (46,47). Work can affect resilience because it can affect the mental, psychological and social conditions of individuals and families due to losing their jobs and poor economic conditions. Therefore, it can cause a crisis of economic resources for individuals and families.

The results showed no influence between age, family type, income, and education on family resilience. Previous research has shown that older adults have different emotional management than young adults (48-50). Adults aged 60 years or older experience a relatively low-stress level compared to young adults during this pandemic. Still, it is associated with family resilience, young and old, showing no effect because each individual tends to manage stressors during the pandemic (51).

In terms of individual education, a bachelor's degree cannot be interpreted as an individual with a lot of knowledge, so the family's resilience is strong. On the contrary, a low level of education cannot be interpreted as weak family resilience (52). Family resilience also cannot be influenced by family types ranging from nuclear families, extended families, and singles, these types of families do not guarantee family resilience, especially during the COVID-19 pandemic (36,53). Therefore, it can be concluded that age cannot determine whether a person's or family's mental, psychological, and social problems are affected by the COVID-19 pandemic. Stress response depends on the response of each individual, not based on age, type and type of family, income, and education.

CONCLUSION

This study shows that work and religious coping factors strongly influence family resilience in communication and problem-solving. During the pandemic, people use religious coping to strengthen the aspect of emotional and spiritual in managing family resilience by utilizing effective communication and positive problem-solving. Therefore, strengthening the community with a religious approach is needed to support the family's line of defense in facing the current pandemic conditions.

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Relationship between exclusive breastfeeding and stunting among children aged 2-5 years in Indonesia

Relación entre la lactancia materna exclusiva y el retraso del crecimiento entre los niños de 2 a 5 años en Indonesia

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SUMMARY

Introduction: *Stunting is a national and global problem that needs attention. Stunting can cause growth and development problems in children. Nutrition is an aspect that is closely related to the incidence of stunting in children. This study aimed to determine the relationship between exclusive breastfeeding and the incidence of stunting in children aged 2-5 years.*
Methods: *This research uses a correlational analytic research method with a cross-sectional design approach. The sampling technique used is simple random sampling with the sample criteria in this study were all mothers with children aged 2-5 years, as many as 109 respondents. Measuring tools for the questionnaire sheet and the Z-Score value. Research analysis using Chi-Square test, (p-value = 0.0001 α = 0.05), p-value < α.*
Results: *Most children were not given exclusive breastfeeding 63 % and 65.9 % of respondents experienced stunting. Exclusive breastfeeding can affect the incidence of stunting. The importance of exclusive breastfeeding in the first six months of a child's age plays a critical role in the 1 000 days of a child's birth and beyond.*
Conclusion: *Stunting children in the future are at risk of having difficulty achieving optimal physical and cognitive development. Breast milk nutrients at each stage of lactation (colostrum, transitional and mature milk) reduce the factors that cause stunting, namely infant morbidity and lack of nutritional intake in infants.*

Keywords: *Exclusive breastfeeding, stunting, children.*

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RESUMEN

Introducción: *La desnutrición crónica es un problema nacional y mundial que requiere atención. El retraso en el crecimiento puede causar problemas de crecimiento y desarrollo en los niños. La nutrición es un aspecto que está íntimamente relacionado con la incidencia de la desnutrición crónica en los niños. Este estudio tuvo como objetivo determinar la relación entre la lactancia materna exclusiva y la incidencia de desnutrición crónica en niños de 2 a 5 años.*
Métodos: *Esta investigación utilizó un método de investigación analítico correlacional con un enfoque de diseño transversal. La técnica de muestreo utilizada es el muestreo aleatorio simple con el criterio de muestreo*

en este estudio son todas las madres con niños de 2 a 5 años, hasta 109 encuestados. Las herramientas de medición fueron la hoja del cuestionario y el valor Z-Score. El análisis de la investigación se realizó mediante la prueba de Chi-cuadrado, (p-valor = 0,0001 α *= 0,05), p-valor <* α.

Resultados: *La mayoría de los niños que no recibieron lactancia materna exclusiva 63 % y el 65,9 % de los encuestados experimentó retraso en el crecimiento. La lactancia materna exclusiva puede afectar la incidencia del retraso del crecimiento. La importancia de la lactancia materna exclusiva en los primeros seis meses de edad de un niño juega un papel fundamental en los 1 000 días del nacimiento de un niño y más allá.*

Conclusión: *Los niños con retraso del crecimiento en el futuro corren el riesgo de tener dificultades para lograr un desarrollo físico y cognitivo óptimo. Los nutrientes de la leche materna en cada etapa de la lactancia (calostro, leche de transición y madura) reducen los factores que causan el retraso del crecimiento, a saber, la morbilidad infantil y la falta de ingesta nutricional en los lactantes.*

Palabras clave: *Lactancia materna exclusiva, retraso del crecimiento, niños.*

INTRODUCTION

Nutrition is one of the factors that determine the level of human health and well-being (1). Good nutrition is determined by a balance and harmony between a person's physical and mental development. Nutritional conditions can be in the form of undernutrition, good or normal, or overnutrition (2). Stunting is a condition of below-standard height at a certain age that increases a person's risk of developing non-communicable diseases such as diabetes, hypertension, obesity, and stroke at an early age (3). Stunting that occurs in childhood is a risk factor for increased mortality, low cognitive abilities and motor development, and unbalanced body functions. Stunting is caused by two factors, namely direct and indirect, one of the direct causes of stunting is not given exclusive breastfeeding (4).

The incidence of stunting is one of the nutritional problems experienced by children in the world today. The average prevalence of stunting under five in Indonesia from 2005-2017 was 36.4 % (5). Based on the 2018 Basic Health Research (6), the stunting rate in Indonesia reached 30.8 %. East Java Province is one of the priority areas for handling stunting problems, as seen from Bappenas 2018-2019 data. The data from the East Java Health Office in 2019 showed the prevalence of stunting at 36.81 %. Data from the Tuban District Health Office in 2020 showed a stunting rate of 12.77 %. This figure has not met the target set by the Tuban Regency Government, namely zero stunting. However, data from all Puskesmas in Tuban Regency that have been obtained, namely the Puskesmas in the working area of the Montong District, obtained achievement in overcoming stunting in 2020 as much as 7.1 % while the target to be achieved is 24 % (6).

Data on the coverage of babies who received exclusive breastfeeding at the Montong District Health Center in 2020 only reached 78 %, whereas, in 2019, the coverage of exclusive breastfeeding reached 83.6 %. In 2020 the number of children weighed as much as 39 100 children and reached 50.1 % of the total 77 975 children. When compared to 2019, this achievement decreased to 50 %. From a total of 39 100 children aged 0-59 who were weighed, there were 6 196 malnutrition children (9.4 %), short children as 8 232 (12.5 %) and underweight children as 5 416 (8.3 %) (7).

The direct causes of stunting are exclusive breastfeeding, infectious diseases, food intake, and birth weight. Furthermore, the indirect factors are parental education, occupation, and family economic status (8,9). Regulation of the Republic of Indonesia Number 33 of 2012 regarding Exclusive Breastfeeding is the provision of breast milk without adding or replacing it with other food or drinks given to babies from birth for six months (10). Exclusive breastfeeding provides various benefits for mothers and babies because breast milk is a natural food for babies, practical, economic, easy to digest, has an ideal composition of nutrients according to the needs and digestive abilities of babies, and breast milk supports the growth of babies, especially height, since the calcium in breast milk more efficiently absorbed than its substitutes (11).

The impact of stunting can be divided into two short-term and long-term effects. The short-term impact is an increase in the incidence of morbidity and mortality, suboptimal cognitive, motor, and verbal development in children, and health costs. The long-term impact is a non-optimal body

posture as an adult (shorter than in general), increasing the risk of obesity and other diseases. Besides that, it declined reproductive health, learning capacity, less than optimal performance during school years, and productivity and work capacity that is not optimal (12).

The government has prepared two programs to tackle stunting: specific and sensitive programs. Particular health programs, for example, exclusive breastfeeding for children, are related to health (13). This study aims to determine the relationship between exclusive breastfeeding and the incidence of stunting in children aged 2-5 years.

METHODS

This type of research was a design study and a correlational analysis using a cross-sectional time approach. The dependent variable was exclusive breastfeeding with categories non-exclusive breastfeeding and exclusive breastfeeding. The independent variable was the incidence of stunting in children aged 2-5 years with criteria for stunting and not stunting. This study's population was all mothers with children aged 2-5 years in Montong District, Tuban Regency, Indonesia, with 150 respondents from 7 villages that match the inclusion and exclusion criteria, namely mothers who have children aged 2-5 years, children aged 2-5 years, children who do not have diseases that affect growth and development. The sample size was 109. The sampling technique used was simple random sampling. The research instrument used a questionnaire on exclusive breastfeeding and stunting using a microtome measuring instrument and an Maternal and Child Health (MCH) Handbook. Data were analyzed using Chi-Square. This research has been ethically cleared by the Health Research Ethics Nahdlatul Ulama Institute of Health Sciences Tuban with the number 0251/LEPK.IIKNU/VIII/2022.

RESULTS

Table 1 show that almost half of 44 (40.7 %) respondents were aged between 5 years, and half of 55 (50.5 %) were female. Based on breast milk production, it can be concluded that most of the 69 (63 %) respondents were not given exclusive breastfeeding. Regarding stunting incidents, it can be concluded that 72 (65.9 %) respondents experienced stunting.

Table 1

Distribution of Respondents by Age, Sex, Breast Milk Production, and Stunting Incidence in Montong District, Tuban Regency

Characteristic	Frequency	Percentage (%)
Age		
2-3 years old	22	19.7
4 years old	43	39.6
5 years old	44	40.7
Sex		
Male	54	49.5
Female	55	50.5
Breast Milk Production		
Exclusive Breastfeeding	40	37
Non-exclusive breastfeeding	69	63
Stunting Incidence		
Stunting	72	65.9
Normal	37	34.1
Total	109	100

Source: Researcher Primary Data, 2021

According to Table 2, 57 (52.7 %) respondents were not given exclusive breastfeeding and experienced stunting. Data analysis using the Chi-Square test obtained a p-value = 0.0001, indicating a significant relationship between exclusive breastfeeding and the incidence of stunting in children aged 2-5 years Montong District, Tuban Regency.

Table 2

Relationship between Exclusive Breastfeeding and Stunting Incidence in Children aged 2-5 Years in Montong District, Tuban Regency

		Stunting Incidence					
		Stunting		Normal		Total	
		n	%	n	%	n	%
Providing Exclusive Breastfeeding	Exclusive Breastfeeding	15	13.2	26	24.2	41	100
	Non-exclusive breastfeeding	57	52.7	11	9.9	68	100
Total		72	65.9	37	34.1	109	100
p value = 0.0001 α = 0,05							

Source: Researcher Primary Data, 2021

DISCUSSION

Based on the results, 63 % of children aged 2-5 years were not exclusively breastfed. This is very far from the exclusive breastfeeding coverage target set by the government. Socio-cultural factors, lack of awareness of the importance of breastfeeding, health services, and health workers have not fully supported the Program for Increasing the use of breast milk. The incessant promotion of formula milk, lack of self-confidence, and lack of knowledge of mothers about the benefits of breastfeeding for themselves and their children become the leading cause of the significant prevalence of infants who are not exclusively breastfed (14). Therefore, health workers are important in educating mothers during the antenatal care (ANC) period, during the postpartum period, and when mothers weigh their children at the Integrated Healthcare Post about breast care and the benefits of breastfeeding (5,15).

Breastfeeding is also associated with the growth of the child's body length. The duration of breastfeeding was positively associated with growth length. The longer the children were breastfed, the faster they grew in the second and third years of life. Children who were not exclusively breastfed were at risk of stunting two times greater than children who were exclusively breastfed (16). Breastfeeding is an important factor in the growth, development, and also healthy of children. Global strategy on infant and young child feeding in 2002 recommended the 4 (four) best eating patterns for children up to the age of 2 years, namely Early Initiation of Breastfeeding in the first 30 to 60 minutes after birth, exclusive breastfeeding until the baby is born. At age 6 months, start giving complementary foods from 6 months and continue breastfeeding until the child is two years old (9,17).

The interpretation of Table 1 data shows that most of the respondents experienced stunting. Stunting is a chronic nutritional problem caused by many factors such as socioeconomic conditions, maternal nutrition during pregnancy, infant morbidity, and lack of nutritional intake. Stunting future children will have difficulty achieving optimal physical and cognitive development and age (10). Stunting is caused by multidimensional factors, including poor nutrition care practices and the lack of maternal knowledge about health and nutrition before and during pregnancy and after the mother gives birth. Stunting is also caused by two factors, directly and indirectly. Direct causes include breastfeeding, exclusivity, infectious diseases, food intake, and birth weight, while indirect factors are parents' education, occupations, and economic status (8). Age is one of the factors that influence the incidence of stunting. The increasing age of children

worsens the risk of stunting (18). The previous result showed a relationship between age and the incidence of stunting in which the incidence of stunting is mostly experienced by children aged 12-24 months or children, which is 67.27 % (19). This is related to the study results, which showed that almost half of the respondents (40.7 %) were five years old. This was due to the risk factors for stunting, namely poor nutritional intake, low birth weight of children, maternal height, and family economic status. Factors that influence the incidence of stunting in Montong District are caused by non-exclusive breastfeeding based on the answers to the questionnaire given by the mother (18).

The analysis of the results show a relationship between exclusive breastfeeding and stunting incidence in children aged 2-5 years. The factors for the incidence of stunting are low family income, suffering from diarrhea, suffering from ARI, low energy adequacy level, low protein adequacy level, parental height, low birth weight, not exclusively breastfed, complementary feeding given too early, and poor parenting less (20). Children who are not exclusively breastfed have a higher risk factor for stunting. Risk factors for stunting include poor nutritional intake, low birth weight of children, maternal height, and family economic status. Low parental education levels are also associated with stunting in children. The description of this study's results supports research in which the result stated that there is a significant relationship between exclusive breastfeeding and the incidence of stunting in children (21). Most children aged 2-5 years in Montong District were not given exclusive breastfeeding and experienced stunting, meaning that the researchers concluded that exclusive breastfeeding could affect the incidence of stunting. Maximizing breastfeeding for up to 6 months, not releasing breast milk too quickly, and giving complementary feeding that is not too early can prevent stunting (22).

CONCLUSION

Most children aged 2-5 years did not receive exclusive breastfeeding and experienced stunting. There is a relationship between exclusive breastfeeding and the incidence of stunting in children aged 2-5 years. Exclusive breastfeeding should be an essential concern for parents by providing mutual support between father and mother. The role of maternity nurses during ANC and INC is important for mothers, especially mothers in the early initiation of breastfeeding.

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An analysis of elderly experience using the GALASEMA application

Un análisis de la experiencia de los adultos mayores utilizando la aplicación GALASEMA

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SUMMARY

Introduction: *The low access of the elderly to use information and communication technology is one of the obstacles to using applications. The purpose of the study was to explore the experience of the elderly using the GALASEMA application.*
Methods: *This study used a descriptive qualitative research design. Semi-structured interviews, observations, and field notes were used to examine 10 participants who applied the GALASEMA application in their daily life for three months. Data analysis used the Colaizzi method.*
Results: *The study found three themes about the experience of the elderly using the GALASEMA application. The themes were elderly health screening, new experiences, and family support.*
Conclusion: *These three themes influence the independence of the support system, increasing cognitive abilities and emotional management abilities of the elderly. This influence significantly affects the quality of life of the elderly.*

Keywords: *Elderly, GALASEMA application, quality of life.*

RESUMEN

Introducción: *El bajo acceso de los adultos mayores al uso de las tecnologías de la información y la comunicación es uno de los obstáculos para el uso de aplicaciones. El propósito del estudio es explorar la experiencia de los adultos mayores utilizando la aplicación GALASEMA.*
Métodos: *Este estudio utilizó un enfoque cualitativo descriptivo. Se utilizaron entrevistas semiestructuradas, observaciones y notas de campo para examinar a 10 participantes que aplicaron la aplicación GALASEMA en su vida diaria durante tres meses. El análisis de datos utilizó el método de Colaizzi.*
Resultados: *El estudio encontró tres temas sobre la experiencia de los ancianos en el uso de la aplicación GALASEMA. Los temas fueron exámenes de salud de ancianos, nuevas experiencias y apoyo familiar.*
Conclusión: *Estos tres temas influyen en la independencia del sistema de apoyo, aumentando las capacidades cognitivas y de gestión emocional de los ancianos. Esta influencia afecta significativamente la calidad de vida de las personas mayores.*

Palabras clave: *Adulto mayor, aplicación GALASEMA, calidad de vida.*

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INTRODUCTION

The elderly is a period with a decline in physical condition, health, and cognitive function (1-3). According to the United Nations, in the world, the elderly population will reach 703 million people in 2019, and the number is expected to exceed 1.5 billion in 2050 (4). The population of elderly will continue to experience an unavoidable increase and many of them are currently in their productive age and will grow older next year. Most of the elderly in Indonesia consist of young elderly, middle elderly, and the elderly. The young elderly were in the age group of 60-69 years, as much as 63.65 %, the middle elderly people were in the age group of 70-79 years, by 27.66 %, and the elderly aged 80 years and over as much as 8.68 % (5). An increase in the population of the elderly will have a significant impact on society and the healthcare system, causing health problems for the elderly (4,6-8).

The elderly are a group at high risk of declining health status. During the current COVID-19 pandemic, many health surveillance activities must be stopped to prevent the transmission of COVID-19, including the Integrated Healthcare Center for the elderly (9). It also provides regular health monitoring, health promotion, and consultation. On the other hand, life expectancy in Indonesia can continue to increase, and it is hoped that the quality of life of the elderly will be maintained and will not require high costs for elderly care (10-12).

Current technological advances will encourage changes in the lifestyle of today's society, where the role of humans begins to change (1). Various types of technology have been introduced to support daily activities, such as computers, the internet, and digital health technology (4). One of the technologies whose use is currently growing rapidly is smartphones. Smartphones allow all ages, including parents, to interact with each other easily (1). Therefore, it is essential to explore this technology to find out the meaning of life, independence, consultation, and the creation of positive feelings for the elderly (13). Over time, especially with technological advances, researchers are making efforts to improve the quality of life of the elderly through the GALASEMA application. GALASEMA stands for Healthy and Independent Elderly Movement and can be used by men and women of all ages, both young and elderly because it has easy-to-understand features to monitor health at home (10). This application contains educational materials to prevent physical and mental illnesses that mostly occur in the elderly. In addition, this application includes exercise videos and diet materials that the elderly can do at home by themselves. The GALASEMA application also includes several assessments to determine the health status of the elderly by answering instruments such as the Barthel Index, Mini Mental Status Exam (MMSE), WHOQOL-BREF, Geriatric Depression Scale (GCS), UCLA Loneliness Scale, and Daily Spiritual Experience Scale (DSES).

The low access of the elderly to use information and communication technology is one of the obstacles to using an application (14). Some elderly said they could not run the GALASEMA application because they did not have a smartphone. In addition, the elderly also complain of health problems when they use technology, such as staring at a cellphone screen for a long time and also fatigue and pain in their hands and eyes. However, some older people are still actively using smartphone technology, so the GALASEMA application can help monitor the health status of the elderly. Based on the explanation above, this study aims to find out the experiences of the elderly in using the GALASEMA application as part of modern communication tools.

METHODS

The Design of The Study

This study used a descriptive qualitative research design. Data were collected in Bandung village, which has the highest number of elderly and is located in rural areas.

Sample Study

This study consisted of 10 participants who came from the local neighborhood area. Participants were chosen conveniently based on their age. These participants represent sources

of information as an important influence in the development of the GALASEMA application. This data was taken from February to March 2022 in Bandung Village, which has the highest degenerative disease cases and is also supported by restrictions on access to health services during the COVID-19 pandemic, which causes the quality of life of the elderly to decline.

Data Collection and Instrument

A semi-structured interview is used to collect information data in developing the GALASEMA application implementation. The interview guide used is Watson's theory. Initial data was obtained through Focus Group Discussion (FGD) involving the role of cadres and policies from regional leaders (village heads) and heads of public health care, and the data was developed into the preparation of in-depth interview guidelines (15). The data is used as an instrument for conducting in-depth interviews. The theory used in making the instrument is a theory that places caring as the basis and central in nursing practice. Caring gives nurses the ability to understand and help clients. A nurse must be aware of nursing care to assist clients in achieving health or achieving death peacefully. This instrument is valid and reliable.

Data Analysis

Colaizzi's qualitative data analysis method was used to analyze the data. The data analysis consists of nine steps (15). The steps for analyzing qualitative data from Colaizzi are as follows, Describe the phenomenon under study. Second, the study tries to understand the phenomenon of his research concept description by enriching the information through literature study and collecting descriptions of phenomena through participants' opinions or statements. In this case, the researcher conducted interviews and wrote them in the form of a transcript to describe the research concept. Third, read the entire description of the phenomenon that all participants have submitted. Fourth, read the interview transcript and quote meaningful statements from all participants. Finally, after understanding the participant's experience, the researcher rereads the transcript of the interview and selects statements in the transcript that are significant and relevant to the study's specific objectives and keywords in the statements that have been selected by providing a marker line.

Describe the meaning of the significant statement. The researcher rereads the identified keywords and tries to find the essence or meaning of the keywords to form categories. Organizing a collection of meanings that are formulated into groups of themes. The researcher reads all the existing categories, compares, and looks for similarities between these categories, and finally groups similar categories into sub-themes and themes. Write a complete description. The researcher assembles the themes found during the data analysis process and writes them into a description in the form of research results. Meet with participants to validate the description of the analysis results. The researcher returns to the participants and reads the grid + the results of the theme analysis. This is done to determine whether the description of the theme obtained because of the study follows the conditions experienced by the participants. Combining the data from the validation results into the description of the analysis results. The researcher reanalyzed the data obtained during the validation for the participants to be added to the final in-depth description of the report so that readers can understand the participants' experiences.

Research Ethics

Ethical permission was sought from the Ethical Committee of Stikes Pemkab Jombang with ethical clearance number 0621120014/KEPK/STIKES-PEMKAB/JBG/XII.2021.

RESULTS

The participants' general information consists of 3 elderlies, 2 families, 2 cadres, ahead of public health, a head of the village, and a midwife.

The results showed from 10 participants who were taken to be able to use the GALASEMA application. Most of the elderly are assisted by their family to access and use the GALASEMA

application. In addition, a pocketbook for the elderly that contains the GALASEMA application was given, so that the elderly read it and can add knowledge and insight to encourage the features of the application.

Table 1

General Information of Participants

Participants	Age	Gender	Education
Elderly 1	50	Female	Elementary
Elderly 2	56	Female	Elementary
Elderly 3	58	Male	Junior High
Family 1	30	Male	Junior High
Family 2	35	Female	Junior High
Cadre 1	48	Female	Senior High
Cadre 2	40	Female	Senior High
Head of public health	40	Female	Bachelor
Head of the village	51	Male	Bachelor
Midwife	35	Female	Diploma

The application can be downloaded from the play store with the keyword "GALASEMA". The content consists of available features, such as a questionnaire of screening education for the elderly, video, diet, and consultation (Figure 1). The results of the study found three themes as experiences in the application of using GALASEMA application. First, after the study, the elderly had a lot of experience using this application and significantly increased knowledge and independence in their health-related needs. Second, all participants said that this application is very useful as a means of companion in the daily life of the elderly. Third, the elderly can solve health problems independently and in collaboration with families and related health workers.

New Experience

The results of the study found three themes as experiences in the application of using GALASEMA application. After the study, the elderly had a lot of experience with using this application and significantly increased knowledge and independence in their health-related needs. All participants said that this application is very

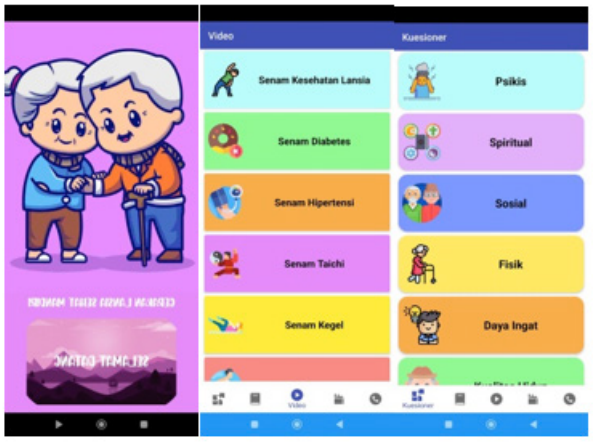

Figure 1. User Interface GALASEMA Application.

useful as a means of companion in the daily life of the elderly. The elderly can solve health problems both independently and in collaboration with families and related health workers.

"*...if I can't sleep at night, I feel dizzy, and my body feels heavy then I now know it's because my blood pressure is rising and I know what I will do about it...*" *(P1)*

"*...the symptom of difficulty remembering or recognizing something is a symptom of dementia, and it should not be ignored, and I will do it...*" *(P2)*

Support System

The role of cadres is very important in the research process. In addition to assisting, cadres can also assist in solving other health-related problems, namely through coordination with health workers, village midwives, and public health care (Puskesmas). The role of the family also provides an optimal role during assistance at home. Support can be physical, social, psychological, informational, and instrumental. The elderly are greatly helped by their families as well as related to applications that use gadgets that require special skills, especially in their operations

"*...I became more comfortable, and it was greatly helped by the presence of village cadres and my family because I was confused about how to open and operate this application, even though*

I can finally be independent now (smiles)…."(P6)

"….At first, I felt lonely because the child had come with his own family. But now I don't feel lonely anymore, my thinking ability has also increased, and my complaints have decreased since this application was introduced, let alone assisted by a very kind cadre…..? (P7)

Health Screening

The GALASEMA application aims to make it easier for the elderly and accompanied by their families. Mentoring activities are usually carried out during the elderly integrated Healthcare Center schedule, which is held twice a month, assisted by Midwives, Cadres, and Village Heads. At the time of the implementation of the Posyandu, there was a weight check, blood pressure, and further socialization about the GALASEMA application.

"….I agree with this GALASEMA application assistance program. The hope is that in the future, the elderly will be able to be independent even though our location is in rural areas; those who were initially ignorant of technology, now they are getting used to this application, and can be applied in their daily lives…." (P9)

"….I am assisting with this application with the help of the cadres. It runs very effectively. The cadres are enthusiastic, and I have data on the development of elderly health, which is very much needed by Public Health Care (Puskesmas) and is the basis for monitoring and evaluation activities for the health of the elderly, especially during post-pandemic conditions like this…." (P10)

DISCUSSION

The GALASEMA applications can improve the quality of life of the elderly independently and routinely. The experience of the elderly in operating the application is a new thing. The new experience makes the elderly interested in trying and solving problems independently through the GALASEMA application. The GALASEMA application keeps the elderly and healthcare providers safe, provides good health services, reduces health provision costs, and decreases morbidity risk and mortality rates during the COVID-19 pandemic (13). These conditions can ultimately improve health screening for the elderly. The screening will provide data and appropriate nursing care for problems that occur in the elderly. These are physical, psychological, and spiritual aspects (16). Elderly health screening contained in the GALASEMA application is also needed as initial data for healthcare facilities. The data can be used as a basis for solving problems in the community and collaborating with Public Health Centre.

The GALASEMA application was used by the elderly and assisted by families and cadres. Many elderly have to adapt to using applications due to technological limitations. Family is essential in assisting the elderly and increasing closeness as a support system for the elderly (17). Cadres also have an equally important part as assistance in terms of education related to the problems faced by the elderly and the use of health facilities to optimize the quality of life of the elderly. Older people with degenerative diseases need related physical and psychological health, social life, and the environment where they live (18). From this statement, the GALASEMA application provides the family support system for their health status

The GALASEMA application can be downloaded on the play store, so everyone can also use the GALASEMA application for the health of the elderly. This application provides a questionnaire for health screening and prepares a feature for consultation. If the elderly want to ask about health, the GALASEMA application for the elderly can be directly consulted through the application. So the elderly and the family feel very helpful, and the family feels that the elderly are becoming more active and have decreased disease and their addiction to caring for the family. The elderly needs health application which easy to understand for the effectiveness of health status (1). This application gives more benefits to the elderly, especially in health screening from home, and the caregiver can manage the health status of the elderly.

CONCLUSION

The elderly experience using the GALASEMA application includes elderly health screening, new

experiences, and family support. This application can increase spiritual, physical, and psychological aspects. Hopefully, this application can also be used for families, cadres, medical personnel, and the community. This application is necessary to prevent the decreasing quality of life among the elderly.

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The relationship between workload and nurses' performance in carrying out nursing care in inpatient at Hospital, Riau Province, Indonesia

La relación entre la carga de trabajo y el desempeño de las enfermeras en la realización de cuidados de enfermería en pacientes hospitalizados, Provincia De Riau, Indonesia

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SUMMARY

Introduction: *The workload is the amount of work required in a job. The heavy workload on nurses can affect their performance. Nurse performance is a skill or ability related to the job description of a professional nurse based on the nursing process. This study aimed to know the relationship between workload and nurses' performance in nursing care.*
Methods: *This study used a descriptive correlation method with a cross-sectional design. The sample in this study were nurses who worked inpatients at a hospital and had scheduled the morning, afternoon, and night shifts with 36 total respondents. This study used a consecutive sampling technique. In collecting the data for this study used the observation sheets. Then the data analysis with univariate and bivariate analysis using the Chi-Square statistical test.*
Results: *Most nurses (61.1 %) have a high workload in the morning shift, and 52.8 % also have an increased workload in the afternoon shift. While on the night shift, most nurses (63.9 %) have a low workload. Amount of 55.6 % of nurses had less performance in the morning shift. At the same time, most nurses performed well in the afternoon shift (52.8 %) and the night shift (58.3 %). The result of this study showed a correlation with a p-value of 0.024 in the morning shift, a p-value of 0.018 in the afternoon shift, and a p-value of 0.030 in the evening shift.*
Conclusion: *A significant relationship exists between workload and nurses' performance in nursing care.*

Keywords: *Nurse, Performance, Workload*

RESUMEN

Introducción: *La carga de trabajo es la cantidad de trabajo requerido en un puesto de trabajo. La gran carga de trabajo de las enfermeras puede afectar su desempeño. El desempeño de la enfermera es una habilidad o habilidad relacionada con la descripción del trabajo de una enfermera profesional basada en el proceso de enfermería. Este estudio tuvo como objetivo conocer la relación entre la carga de trabajo*

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y el desempeño de los enfermeros en el cuidado de enfermería.
Métodos: *Este estudio utilizó un método de correlación descriptivo con un diseño transversal. La muestra en este estudio fueron enfermeras que trabajaban con pacientes internados en un hospital y tenían turnos de mañana, tarde y noche, con un total de 36 encuestados. Este estudio utilizó una técnica de muestreo consecutivo. En la recolección de datos se utilizaron las fichas de observación. Luego el análisis de datos se realizó con el análisis univariado y bivariado, utilizando la prueba estadística Chi-cuadrado.*
Resultados: *La mayoría de los enfermeros (61,1 %) tienen carga de trabajo alta en el turno de la mañana, y 52,8 % también tienen carga de trabajo aumentada en el turno de la tarde. Mientras que, en el turno de noche, la mayoría de los enfermeros (63,9 %) tienen una baja carga de trabajo. El 55,6 % de los enfermeros tuvieron menor desempeño en el turno de la mañana. Al mismo tiempo, la mayoría de las enfermeras se desempeñaron bien en el turno de la tarde (52,8 %) y en el turno de noche (58,3 %). El resultado de este estudio mostró una correlación con un valor de p de 0,024 en el turno de la mañana, un valor de p de 0,018 en el turno de la tarde y un valor de p de 0,030 en el turno de la noche.*
Conclusión: *Existe una relación significativa entre la carga de trabajo y el desempeño de las enfermeras en el cuidado de enfermería.*

Palabras clave: *Enfermera, desempeño, carga de trabajo.*

INTRODUCTION

The hospital is a health organization full of human and scientific resources. Hospitals are also an important part of the health system's development and support the provision of health services for the community (1). The hospital is an institution that provides comprehensive health services for individuals who provide services, including inpatient, outpatient, and emergency services (2-4). As a health service center, hospitals must provide safe, effective, and quality health services for their patients (5-7).

Improving the quality of hospital services depends on the quality of nursing services provided to patients because nursing services are one of the factors that affect the image of the institution in the eyes of the community. This happens because nurses are the most professional, foremost, and closest to suffering, as well as the pain felt by patients and their families (8-10). In addition, nurses have many duties and responsibilities in hospitals, so the work carried out by nurses can cause a workload with many tasks and pressures (11). The workload is the high volume of work given or charged to workers, both in the form of physical and mental burdens for which they are responsible (12,13).

Based on the results of research by Myny et al., in 2012 showed that the factors that most influence the workload of nurses are the increasing number of interruptions in work, the increasing number of incoming patients compared to outgoing patients, the work schedule that is carried out, and the lack of agreement among organizations to help the ward which a shortage of nurses (14). Amount of 80 nurses, 83.8 % have a high workload as measured by the NASA Task Load Index (NASA-TLX) questionnaire, which is obtained from six dimensions of workload. The highest is physical work (78.00 ± 19.97) (15).

Based on the study of Rizkyet al., 32 (78 %) respondents stated that they experienced a high workload, while nine other (22 %) respondents stated that they experienced a moderate workload (16). The workload is one of the factors affecting work productivity or performance (17). Performance is the quality or quantity of work results or work achievements produced by groups or individuals in certain activities on the abilities possessed from the results of the learning process and the desire to achieve work performance (18). Performance appraisal in hospitals focuses on monitoring the performance of healthcare providers that focuses on improving the quality of practice in nursing services (19).

Nursing services are a part that plays an important role in improving the quality of health services through the implementation of nursing care based on nursing care practice standards, where nursing care standards are a description of the expected performance (20). However, based on the results of research conducted by Ball et al., in 2014 showed that most nurses, as many as 86 %, did not provide comprehensive nursing care to patients due to insufficient shift time. In addition, nursing activities often unresolved are establishing communication with patients or entertaining patients 66 %, educating 52 %, and developing or evaluating nursing care plans for

patients, 47 % (21). Based on this, the researcher was interested in assessing the relationship between workload and the performance of nurses in carrying out nursing care in the inpatient room.

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METHODS

This type of research was quantitative with a descriptive correlation design and a cross-sectional approach. The sample in this study was nurses who worked in a class III inpatient room at a hospital in Riau Province, Indonesia. This hospital has an official schedule of 3 shifts (morning, afternoon, and night). The sampling technique in this study was consecutive sampling. The inclusion criteria are nurses who work in class III inpatient rooms and have an official schedule of 3 shifts. This study's exclusion criteria were nurses on leave, the head of the room, and the team leader. The data collection of this research used a work sampling form for the workload of nurses and an observation sheet on the performance of nurses in carrying out nursing care which consisted of 19 statement items that had been tested for validity. The variables studied in this study were the independent variable, namely workload, and the dependent variable, namely the performance of nurses in carrying out nursing care. In this study, the data analysis used was univariate and bivariate data analysis and used the Chi-Square statistical test. This research conducted an ethical review with the ethics test number 248/KEPK/STIKes-HTP/IV/2022 by the Sekolah Tinggi Ilmu Kesehatan Hang Tuah Ethics Committee, Pekanbaru.

RESULTS

Based on Table 1, it is known that the average age of the respondents was 33.94 years. Most nurses were female, namely 77.8 %, with the most education being Bachelor of Nursing + Profession of Nursing as much as 52.8 %. Most nurses had a working period of > 5 years, which was 63.9 %, and the majority did not have training experience related to nursing care, much as 58.3 %. Most nurses on the morning shift had a high workload of 22 people (61.1 %). In the afternoon shift, most nurses also had a high workload of 19 people (52.8 %), and a minority of nurses had a low workload of 2 people (5.6 %). While on the night shift, most nurses had a low workload of as many as 23 people (63.9 %). Most nurses, as many as 20 people (55.6 %), had poor performance on the morning shift. Meanwhile, in the afternoon shift, the majority of nurses had a good performance, as many as 19 people (52.8 %), and the majority of nurses also had a good performance on the night shift, as many as 21 people (58.3 %) (Table 2).

Table 1

Frequency Distribution of Respondents by Age

Variable	Mean	Median	Std. Deviation	Min-max
Age	33.94	33.50	6.118	25-46

Table 2
Frequency Distribution of Respondents

Respondents Characteristic	f	%
Sex		
Female	28	77.8
Male	8	22.2
Education		
Associate Degree of Nursing (D3)	17	47.2
Bachelor of Nursing (S1) + Professional Nurse	19	52.8
Duration of work		
≤5 years	13	36.1
>5 years	23	63.9
Training Experience related to Nursing Care		
Experienced	15	41.7
Inexperienced	21	58.3
The workload on the Morning Shift		
High	22	61.1
Moderate	14	38.9
Low	0	0
The workload on the Afternoon Shift		
High	19	52.8
Moderate	15	41.7
Low	2	5.6
The workload on Night Shift		
High	0	0
Moderate	13	36.1
Low	23	63.9
Nurse Performance on Morning Shift		
Good	16	44.4
Not Good	20	55.6
Nurse Performance Afternoon Shift		
Good	19	52.8
Not Good	17	47.2
Nurse Performance Night Shift		
Good	21	58.3
Not Good	15	41.7
Total	36	100.0

Table 3 shows that of the 22 respondents with a high workload, six people (27.3 %) with good performance, and 16 people (72.7 %) with poor performance. While the 14 respondents had a moderate workload, there were ten people (71.4 %) with good performance and four (28.6 %) with poor performance. Based on the results of statistical tests, Chi-Square obtained a p-value of 0.024, which indicated a relationship between workload and the performance of nurses in carrying out nursing care in the morning shift. Table 3 also showed that of the 19 respondents with a high workload, there were six people (31.6 %) with good performance and 13 people (68.4 %) with poor performance. Meanwhile, 17 respondents have medium and low workloads. There were 13 people (76.5 %) with good performance and four people (23.5 %) with poor performance. Based on the results of statistical tests carried out with the Chi-Square test on cell mergers, a p-value of 0.018 was obtained, indicating a relationship between workload and nurse performance in nursing care on the afternoon shift. There were 13-night shift respondents with a moderate workload, four people (30.8 %) with good performance, and nine people (69.2 %) with poor performance. While the other 23 respondents who have a low workload found 17 people (73.9 %) with good performance and six people (26.1 %) with poor performance. Based on the results of statistical tests with Chi-Square obtained a p-value of 0.030, there was a relationship between workload and the performance of nurses in carrying out nursing care on the night shift.

Table 3

The Relationship Between Workload and Nurse Performance in Performing Nursing Care in The Morning, Afternoon, and Evening Shifts

Work Load	Nurse Performance		Total	p-value
	Good	Poor		
Morning Shift				
High	6 (27.3 %)	16 (72.7 %)	22 (100 %)	0.024
Moderate	10 (71.4 %)	4 (28.6 %)	14 (100 %)	
Total	16 (44.4 %)	20 (55.6 %)	36 (100 %)	
Afternoon Shift				
High	6 (31.6 %)	13 (68.4 %)	19 (100 %)	0.018
Moderate + Low	13 (76.5 %)	4 (23.5 %)	17 (100 %)	
Total	19 (52.8 %)	17 (47.2 %)	36 (100 %)	
Night Shift				
Moderate	4 (30.8 %)	9 (69.2 %)	13 (100 %)	0.030
Low	17 (73.9 %)	6 (26.1 %)	23 (100 %)	
Total	21 (58.3 %)	15 (41.7 %)	36 (100 %)	

DISCUSSION

The results of this study indicate that most respondents have a high workload in the morning and afternoon shifts. While most respondents have a low workload on the night shift. The results of this study found that most respondents had poor performance on the morning shift. The workload in nursing is defined as the amount of performance required in a job (22). The workload can be measured by calculating how much time nurses use to provide nursing services to patients, including direct and indirect nursing actions (23). The results of this study are in line with research by Romadhoni and Pudjirahardjo in 2016, which stated that the workload of morning shift nurses in inpatient installations was high (90.70 %), and the afternoon shift was also high (85.56 %) (24). However, the workload of night

shift nurses was 84.13 %. The previous research stated that the nurses' workload in the inpatient room would show significant differences in each shift (25). These differences theoretically can occur due to different working hours. Based on the description above, the researcher concludes that the workload is the amount of time used in productive activities during the work shift, both in direct nursing actions and indirect nursing actions. The higher the time nurses use in productive activities, the higher the workload experienced by nurses. Vice versa, if the less use of time in productive activities utilized by nurses, the lower the workload experienced by nurses will be.

The study's results found that most respondents had poor performance on the morning shift. While most respondents have a good performance on the afternoon shift, most of the others have a good performance on the night shift. Nurse performance is a skill or ability related to the job description of a professional nurse based on nursing care standards (26). The results of this study are not in line with the results of Irawan in 2017 (27), which stated that the performance of nurses on the morning shift has the highest average of 4.18 compared to the day shift, which has an average of 4.00 and the night shift which has an average of 3.73. This study explains that this can happen because the morning shift is when nurses have high morale to perform better than the night shift.

On the other hand, it is the time when nurses should rest. Thus, they are not optimal in providing nursing care. Patient satisfaction in the hospital depends on the suitability of patient expectations about the services provided and the perceived performance of nurses (28). Therefore, the high performance of nurses in providing nursing care will improve the quality of health services. Based on the description above, the researcher concludes that performance is the result of the work of nurses based on their skills or abilities in carrying out the task of providing comprehensive nursing care based on nursing process standards. Based on the researcher's analysis of the results of this study, it was found that most nurses had good performance on the afternoon and night shifts. However, most nurses have poor performance in the morning shift. This can happen because it is influenced by the number of nursing actions nurses must complete. The many productive activities of nurses can illustrate this during the morning shift compared to the afternoon and evening shifts.

The results showed a relationship between workload and the performance of nurses in carrying out nursing care in the morning, afternoon, and evening shifts. Several factors affect nurses' workload, including internal factors that come from workers, such as body health conditions, nutritional status, perceptions, motivation, and job satisfaction, as well as external factors that affect nurses' workload (17). Factors affecting the workload are the number of tasks accepted to be completed. Besides that, other factors are the work's difficulty level, the length of time given, and the work environment. While the factors that can affect the performance of nurses consist of internal factors in the form of high abilities and hard workers who can produce quality performance (26). External factors that can affect performance are derived from the environment in the form of behaviour and attitudes of co-workers, organizational climate, work facilities, and subordinates or leaders. This study is supported by the results of Purwanti and Ediyono's 2022 research (29), which stated that excessive workload has a significant relationship to the performance of nurses in public health services. Therefore, two factors affect the performance of nurses: internal and external factors. External factors that affect the performance of nurses in this study are the imbalance between the workload of nurses and the demands of the public health science, which require nurses to perform non-nursing activities such as completing administrative tasks and managing Health Operational Assistance (BOK) and the imbalance in the number of nurses, while internal factors that can affect performance the nurse is the ability possessed by the nurses in performing their responsibilities.

CONCLUSION

Based on the results of the study, it was found that there was a relationship between workload and the performance of nurses in carrying out nursing care. However, a further researcher could conduct a study by adding other variables such as training experience and work environment

facilities. Besides that, other factors which can be added are using different methods and designs and a larger number of samples.

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Psychological experience of women post total abdominal hysterectomy bilateral salpingo-oophorectomy

Experiencia psicológica de mujeres post histerectomía abdominal total salpingo-ooforectomía bilateral

Ramdya Akbar Tukan[1a*]

SUMMARY

Introduction: *Total abdominal hysterectomy bilateral salpingo-oophorectomy (TAH BSO) is still a severe problem for women, especially in psychology. Women will feel inferior because their existence does not have several vital reproductive organs. This study explores women's psychological experiences after TAH BSO surgery.*
Methods: *The research design used was a qualitative phenomenological study. This study used seven women after TAH BSO surgery as participants. The method used to withdraw participants was based on objectives (purposive sampling). The research instrument was the researcher's assisted in-depth interview guide and a voice recorder. The data analysis used was the interpretative phenomenological analysis method.*
Results: *This study resulted in 2 themes, including the psychological response to the TAH BSO operation and self-concept. Five sub-themes were obtained about women's psychological experiences after TAH BSO surgery. They were 1) feelings when going to undergo TAH BSO surgery, 2) feelings after TAH BSO surgery, 3) negative self-concept, 4) concept of positive self and 5) maintaining socialization and interaction.*
Conclusion: *The initial psychological response shown by patients who will undergo TAH BSO surgery based on the results of this study was a response of shock, fear, and sadness. This appears reflexively and only immediately accepts and switches to the desire to undergo the healing process.*

Keywords: *Psychological experience, TAH BSO, women*

RESUMEN

Introducción: *La histerectomía abdominal total salpingooforectomía bilateral (TAH BSO) sigue siendo un grave problema para las mujeres, especialmente en la psicología. Las mujeres se sienten inferiores porque en su existencia no tiene varios órganos reproductivos vitales. Este estudio explora las experiencias psicológicas de las mujeres después de la cirugía TAH BSO.*
Métodos: *El diseño de investigación utilizado fue un estudio cualitativo fenomenológico. Este estudio utilizó como participantes a siete mujeres después de la cirugía TAH BSO. El método utilizado para retirar a los participantes se basó en objetivos (muestreo intencional). El instrumento de investigación fue la guía de entrevista en profundidad y una grabadora de voz. El análisis de datos utilizado fue el método de análisis fenomenológico interpretativo.*

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Resultados: *Este estudio resultó en 2 temas, incluida la respuesta psicológica a la operación TAH BSO y el autoconcepto. Se obtuvieron cinco subtemas sobre las experiencias psicológicas de las mujeres después de la cirugía TAH BSO. Eran 1) sentimientos al ir a someterse a la cirugía TAH BSO, 2) sentimientos después de la cirugía TAH BSO, 3) autoconcepto negativo, 4) concepto de sí mismo positivo y, 5) mantener la socialización y la interacción.*
Conclusión: *La respuesta psicológica inicial mostrada por los pacientes que serán sometidos a cirugía TAH BSO basada en los resultados de este estudio fue una respuesta de shock, miedo y tristeza. Este aparece reflexivamente y solo se acepta inmediatamente y cambia al deseo de someterse al proceso de curación.*

Palabras clave: *Experiencia psicológica, TAH BSO, mujeres.*

INTRODUCTION

Hysterectomy is the surgical removal of the uterus. There are many surgical and conservative treatment options in medical science. However, a hysterectomy is the most common gynecological procedure performed worldwide (1,2). A hysterectomy procedure was performed because of malignant and benign diseases. It is included pelvic pain, dyspareunia, uterine myoma, adenomyosis, endometriosis, and menometrorrhagia (3-5). This disease is very dangerous for women. The impact of hysterectomy on sexual function is of great concern to women. Moreover, it is a major source of preoperative anxiety (6-8).

Hysterectomy surgery is still high in some countries, such as the United States, at around 600 000 per year. Denmark had 98 484 surgeries from 2000 to 2015 (9). An amount of 40 % of women worldwide will undergo a hysterectomy at the age of 64 years. The indications mostly relieve symptoms due to benign pathology, improving quality of life (10). Hysterectomies treat diseases such as cervical cancer, uterine myoma, and ovarian cancer (11).

Sexuality due to Total Abdominal Hysterectomy Bilateral Salpingo-Oophorectomy (TAH BSO) surgery includes sexual desire disorders, sexual arousal disorders, orgasm disorders, and pain during sexual intercourse (12). Thus, it affects the decrease in satisfaction and desire disorders that women often experience after TAH. BSO in the life of the woman's sexuality. The response to women's sexuality after TAH BSO is that they often feel anxious about their sexual life. This disturbs the psychology of women after TAH BSO surgery; therefore, sexuality problems for women after the removal of the uterus, cervix, tubes, and ovaries, and the woman having a husband will become separate problems. This is related to women's psychology, which can harmonize husband and wife relationships. Sexual health is a condition that shows a person's physical and emotional (13,14). Social well-being is related to his sexuality, meaning that a person's health and illness are not only seen by disease but also by impaired sexual function, sexually weak or strong. But also, sexual health includes positive and respectful views and attitudes toward sexuality and sexual relationships. Hysterectomy can affect a woman's sexual function due to psychological factors (15,16). This study studied in depth the psychological experience of the patient after the TAH BSO procedure was conducted. This study aimed to explore women's psychological experience after TAH BSO.

METHODS

This study used a qualitative design with the phenomenological method of Interpretative Phenomenological Analysis (IPA). This aimed to analyze the psychological experiences of women after TAH BSO. The IPA phenomenological method focused on the psychological experiences of participants' feelings and found patterns of participant characteristics. The research sample was taken using the purposive sampling method. In this case, the participants obtained were seven women after TAH BSO surgery. The research was conducted in May 2017. Participants were selected according to the inclusion criteria, including 1) Women with ovarian cysts and uterine myomas (benign tumors) without adhesions, who had completed TAH BSO surgery for more than six weeks; 2) Women who were still actively menstruating before the TAH BSO operation; 3) Having a partner (married), and living in the same house; 4) Understanding Indonesian language and be able to tell the experiences of women's sexuality after BSO TAH; 5) Domiciled in the

city of Surabaya. Exclusion criteria included 1) Post-TAH BSO women with malignant disease; 2) Post-TAH BSO women with endometriosis, uterine prolapse, and pelvic infection; Direct interviews with participants were conducted in separate rooms in a quiet atmosphere without disturbance. The researcher's interviews were recorded and kept confidential. Interviews occurred last 30-80 minutes per person. The data obtained from in-depth interviews with participants were analyzed using the IPA method to clarify the situation experienced by women after TAH BSO (17). It was performed by exploring the women's psychological experience in detail and depth and finding the meaning contained in a phenomenon. The Surabaya Hajj Hospital Ethics Committee reviewed and approved this study with Ethics Number 073/09/KOM.ETIK/2017. Each participant has signed the informed consent.

RESULTS

The results of this study were obtained through in-depth interviews with participants, field notes were taken at the time of the interview, and a study of archival data. Based on the results of data analysis, researchers got two themes and five sub-themes that became the results of this study. The themes obtained about the experience of women's sexuality after TAH BSO surgery was 1) Psychological responses to TAH BSO surgery and 2) Self-concept. The sub-themes obtained about the experience of women's sexuality after TAH BSO surgery was 1) feelings when going to undergo TAH BSO surgery, 2) feelings after TAH BSO surgery, 3) negative self-concept, 4) positive self-concept, and 5) maintaining socialization and interaction.

Table 1

Psychological Response to TAH BSO Surgery

Theme	Sub-theme	Category	Keyword
		Denial	Shock
Psychological Response to TAH BSO Surgery	Feelings before TAH BSO Surgery	Accepted	Afraid Sad Sincere
	Feelings after TAH BSO Surgery	Denial Bargaining Accepted	Shock Regret Relief
Self-Concept	Negative Self-Concept	Low Self-Esteem	Insecure after TAH BSO surgery Afraid of not being able to make her husband happy Feeling inferior because you cannot give offspring anymore
	Positive Self-Concept	Positive Self-Assessment	Introvert Extrovert Optimistic Confident
	Maintaining socialization and social interaction	Social and social interaction	Negative self-concept but able to maintain socialization and social interaction Negative self-concept and unable to maintain socialization and social interaction Positive self-concept and ability to maintain socialization and social interactions

Theme 1. Psychological Response to TAH BSO Surgery

The psychological response to the TAH BSO surgery shown by the participants was an inner mood or feeling that was expressed expressively and verbally. Data were obtained from direct observation of physical symptoms and participant expressions, in-depth interviews, and written archive data in patient medical records.

Sub-Theme 1.1 Feelings When Going to Undergo TAH BSO Surgery

Most participants' first response was fear when they heard that they would undergo TAH BSO surgery because they were worried that the surgery failed and caused death. As stated by the participants as follows:

"Yes, I'm afraid, (while holding my chest with both palms) afraid of being taken by the God. I'm afraid the surgery will fail, and I will die. Moreover, I still have small children" (P3)

"Yes, I'm afraid (convincing tone of voice) of surgery again, I just finished giving birth, so I have to wait three months" (P4)

"I do not dare to have surgery. I'm afraid to be surgery on" (P5)

The responses felt by the participants were shock, fear, sadness, and sincerity, which were shown by verbal and non-verbal expressions.

"*Yes, I no longer have a burden (while holding my hands together). Maybe for me, if I lift it like this, it does not matter. It is like a sick person getting medicine, that is all, so there is no anxiety or anything" (P1)*

"... sad to have her uterus removed (participants' eyes started to tear up)" (P2) (P4)(P7)

"...I was surprised how come (a firm tone of voice)..." (P3)

Sub-Theme 1.2 Feelings After TAH BSO Surgery

The feeling most frequently expressed by participants was a relief after undergoing TAH BSO surgery. Participants said that what was experienced was nothing to regret. Feelings of sincerity and resignation enabled them to accept the conditions experienced at this time so that no feelings of worry were felt. As stated by participants as follows:

"Because maybe I'm all ready. So, my feelings are just normal" (P1)

"Yeah, it's normal. My two children have grown up. I don't have any feelings, the main thing is that the disease has been taken away, there is no problem whatsoever" (P6)

The uterus is an organ that is considered the most vital for a woman, especially for women who do not have children or want additional offspring. This condition was found in participants still expecting more biological offspring, while sad expressions were different for female patients who had considered enough offspring.

"Anyway, the shock feels like a grieving person from a family who died when he was told that his mother's womb was removed. I was immediately shocked. The tears never stopped and kept coming out until the recovery room was like that (while shedding tears)" (P2)

The following response found in participants was regret because as a woman with her uterus and ovaries removed, she would experience early menopause. In addition, participants felt inferior and felt old.

"I was removed from the womb, I could not menstruate anymore, or I had an early menopause, which I regret. Everything feels like it has withered, isn't it? At the age of 40, it is like 55 (pouting face)" (P4)

Theme 2. Self-concept

The self-concept in the results of this study relates to the participants' self-assessment, which affects the individual's sexual relationships and social relationships as well as interactions with the community. Self-concept is a picture of what we think about ourselves and how others view us, which consists of self-image, self-esteem, and views about sexuality.

Sub-theme 2.1 Negative Self-concept

Three participants expressed negative self-concepts, which is a feeling of inferiority after TAH BSO surgery.

"*...Yes, I feel inferior, because I feel old, I have menopause early, yes, husbands first, right, we have to be like friends like brothers, husbands have to bring their wives, right, you know, I feel older like that (with frown face)" (P4)*

Participants also expressed feelings of inferiority and fear of being unable to make their husbands happy when having sex. As stated by the following participants:

"*Yes, I feel inferior, like I'm old (while drooling on her forehead). I don't know why it's like this, yes, sometimes I also say to Bapak (husband), what if I have changes (physically) I'm afraid I can't satisfy Bapak (while having sex) ..." (P3)*

Participants also expressed feelings of inferiority due to physical changes. They were no longer able to get pregnant due to having their womb removed during TAH BSO surgery and feeling old because they experienced early menopause. as stated by the participants below:

"Yes, I want to have more children with my second husband, this is when we talk about age, especially when the womb has been removed, so I feel inferior (while crying) with my husband" (P2)

Participants also revealed that they wouldn't be open about the womb that had been removed. Participants did not want neighbors and family to know if the uterus had been removed.

"So it's for the community's problem if you can cover it up "(P4)

Sub Thema 2.2 Positive Self-concept

Participants expressed more positive self-assessment, did not feel inferior to their husbands, family, and neighbors, and perceived themselves as usual before and after TAH BSO surgery. Participants' expressions related to positive self-concept were open, optimistic, and confident. As stated by the following participants:

"Anyway, we (husband and wife) understand each other. It's not a problem. it is just normal..." (P1)

"The neighbors all know that if I am sick, the womb has been removed"(P2)(P6)

"Everyone said why didn't you have surgery from the start? It's good that you've recovered from a long time ago, everyone said that" (P5).

Sub Theme 2.3 Maintaining Socialization and Interaction

Participants in this study revealed the social relationships in the social environment. The results of in-depth interviews with participants show that most reveal social activities and interactions with the community environment to be the driving force of life. Through this research, it can also be seen that not all participants' expressions of negative self-assessment are correlated with the inability to maintain socialization and interaction. Even though the self-assessment was negative, one participant maintained socialization and interaction, such as being a Posyandu cadre, an Elderly cadre, and a Mother of Early Childhood Education. As stated by the participants below:

"*...yes, I am an integrated health center cadre, initially in the elderly and in toddlers, it continues to be replaced in the elderly, now the Play Group's mother is also (with a smile) " (P2)*

Other participants with negative self-assessment cannot maintain socialization and social interaction, so they are not active in their community, such as family welfare movement gatherings, recitations activities, or others. As stated by the participants below:

"Nothing, (shaking her head) I don't participate in any activities at home, yes there is a PKK gathering, but I don't participate, I'm afraid I feel inferior..." (P3)

"Yes, I'm inferior, I don't participate in the community activities, for now, I'm off ..." (P4)

DISCUSSION

The results showed a psychological response to the TAH BSO operation, namely shock, fear, sadness, and sincerity because they felt they would

lose something precious to a woman, namely the womb. Participants had a grieving response when they understood they were about to have their wombs removed. This follows the theory presented by Kubler-Ross (18), which stated that a person's grieving stages consist of denial, anger, bargaining, and depression. The grieving response experienced by participants when they were about to undergo TAH BSO surgery was more due to a feeling of loss. A previous study that supports this study's results explained that women who undergo TAH BSO surgery experience psychological stress, anxiety, and mild depression (19). The study used a sample of 40 patients who underwent hysterectomy for benign gynecological diseases, in line with the research conducted (20), which described women who undergo TAH-BSO surgery will have a high level of depression. The study was conducted on women aged 40-60 years at Haydarpasa Hospital, Turkey, using a quantitative method by measuring the level of depression in patients undergoing TAH-BSO surgery. Although methodologically different, this study's results support this study's findings, namely that women who will undergo TAH BSO surgery experience psychological pressure.

Psychological response of patients after undergoing TAH-BSO surgery. The subjects studied showed a feeling of relief in the receiving category. Patients who have not had TAH BSO surgery have problems with sexual function, which has implications for psychological conditions and makes patients easily emotional. The disappearance of the disease by undergoing TAH BSO surgery resolved the sexual dysfunction. Most sexual disorders improve after hysterectomy surgery (21). Another study supporting this study described depression, anxiety, body image, and subjective gynecological symptoms as improving after surgery (22). In the study, it was explained that before the hysterectomy surgery, the patient had a high level of stress, including after the operation, the patient still had a stress level for up to one month. After that, it would return to normal and feel happy.

This study also illustrates that most post-TAH BSO participants have positive self-concepts. The form of the assessment is that participants are open to the circumstances they are experiencing. So that all information related to the condition of the self after the TAH BSO operation can be received, making the participants' quality of life better. A positive self-concept is manifested from an optimistic attitude. As revealed by previous research, individuals with a positive assessment of sexual self-concept will be easier to express feelings which will facilitate sexual behaviour because, in this case, the individual will have passion and romantic feelings, and openness (23). On the other hand, individuals with a negative self-concept assessment will have obstacles in expressing their feelings, ultimately affecting their sexual behaviour. A person with a positive self-concept would have a healthy self-concept, self-esteem and self-confidence so that she can modify old values with future experiences, overcome problems, and accept herself as an equal to others (24).

Post-TAH BSO patients who have a negative self-concept tend to have inferior feelings. Research illustrates that negative self-assessment is due to self-perception that they have early menopause, can no longer get pregnant, and feel old. The study's results align with research which explained that post-hysterectomy women tend to have a negative self-concept due to the role of a physical image, feeling that their physical condition is declining and making them sensitive when interacting socially with the community (25). Furthermore, regarding sexual self-esteem in this study, it is described as a result of self-assessment of participants who have negative self-responses expressing feelings of inferiority because they are afraid of being ostracized by people around them, feelings of inferiority towards their husbands because of physical changes, feelings of imperfection in their husbands because they are unable to carry out their roles as a wife and this leads to low self-esteem in sexual life. Furthermore, it causes a reduction or loss of sexual desire, even suppressing sexual feelings so that they think not to have sex again (24). The results of the study following research conducted in their qualitative approach reported that after a hysterectomy, the patient felt lost and sad because he could not have children and lost his identity as a woman, and felt he was no longer useful as a woman (26). Other supporting research explains that further effects on post-hysterectomy psychology are low self-esteem and sometimes still sad when

remembering the hysterectomy incident that has been experienced, but in the end, being able to adapt to environmental conditions (27).

Regarding the ability to maintain socialization and interaction of women after TAH BSO surgery, it is influenced by the support of the husband, family, and society. So that in the end, the person can interact again or not. As in this study, there were no significant changes in appearance. Some participants still had good self-esteem and received support from family, husbands, and people around, so they could still socialize. Therefore, most post-TAH BSO women still have a positive self-assessment of the new conditions and maintain the conditions of socialization and interaction with the environment. On the other hand, there was a dominant negative response due to the physical image of women who no longer had a uterus and experienced early menopause, but this was only slightly in the participants of this study because the age distribution was over 40 years old (28).

CONCLUSION

The findings from this research resulted in the theme of psychological responses to the TAH BSO operation and self-concept. Women after TAH BSO faced a series of important experiences that changed their perspective on life and sex but were able to return to living a normal life and building a social environment like women without TAH BSO experience. Therefore, the results of this study can be used to provide an overview of the experience of female sexuality after undergoing TAH BSO surgery on nurses. Moreover, it also can be used as a basis for developing nursing services in a supportive form after undergoing TAH BSO surgery to be able to adapt and socialize.

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Web-Based public health center management information system using Codeigneter and Ajax techniques at Public Health Canter

Sistema de información de gestión del centro de salud pública basado en la web utilizando Codeigneter y técnicas Ajax en el Centro de Salud Pública

Reno Renaldi[1a]*, Yesica Devis[2a], Lita Lita[3a], Muhammad Dedi Widodo[4a], Rizer Fahlepi[5a]

SUMMARY

Introduction: *The development of science and technology at this time, especially in computerization, has developed rapidly. Computers are beneficial in completing various fields of work because they can save time and money to provide satisfactory results. However, the public health center's data management process is still manual, and it is ineffective in managing data and time inefficient, resulting in less effective performance. This research aimed to find data and make it easier to create reports or record data, which will be effective in terms of time and management data.*
Methods: *This study used the waterfall method with five stages, namely requirements, system design, implementation, integration, testing, operation, and maintenance. This system performs system planning that will be made based on the previous stage so that this system is made according to the needs of the community health center. This analysis use performance, information, economy, control, efficiency, and services (PIECES).*
Results: *The results of this study were the creation of a web-based information system program at the Public Health Center. Testing using black boxes, the application of this personal data management information system can run well, free from script errors, and functionally produce the expected results.*
Conclusion: *The management data on information system application aims to make managing data at the health center easier. A backup system is recommended to be made, so existing data is stored in history data.*

Keywords: *Health Center, Information System, Waterfall Method, Web Based Program*

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RESUMEN

Introducción: *El desarrollo de la ciencia y la tecnología en este momento, especialmente en la informatización, se ha desarrollado rápidamente. Las computadoras son beneficiosas para completar varios campos de trabajo porque pueden ahorrar tiempo y dinero para brindar resultados satisfactorios. Sin embargo, el proceso de gestión de datos del centro de salud pública sigue siendo manual, y es ineficaz en la gestión de datos y tiempo ineficiente, lo que resulta en un desempeño menos efectivo. Esta investigación tuvo como objetivo encontrar datos y facilitar la creación*

de informes o registros de datos, que serán efectivos en términos de tiempo y gestión de datos.
Métodos: *Este estudio utilizó el método de cascada con cinco etapas, a saber, requisitos, diseño del sistema, implementación, integración, prueba, operación y mantenimiento. Este sistema realiza la planificación del sistema que se realizará en base a la etapa anterior para que este sistema se realice de acuerdo a las necesidades del centro de salud comunitario. Este análisis utiliza rendimiento, información, economía, control, eficiencia y servicios (PIECES).*
Resultados: *Los resultados de este estudio fueron la creación de un programa de sistema de información basado en la web en el Centro de Salud Pública. Probando con cajas negras, la aplicación de este sistema de información de gestión de datos de personal puede funcionar bien, sin errores de script y producir funcionalmente los resultados esperados.*
Conclusión: *La aplicación de gestión de datos en el sistema de información tiene como objetivo facilitar la gestión de datos en el centro de salud. Se recomienda realizar un sistema de respaldo, de modo que los datos existentes se almacenen en los datos históricos.*

Palabras clave: *Centro de salud, sistema de información, método Cascada, Programa Web.*

INTRODUCTION

Health is a problem in most countries in the world, including Indonesia, the cause of which is dominated by the inability of the community to handle personal and environmental health. With the rapid population growth and the complexity of public health problems, it is necessary to strengthen the role of public health center services as the primary health service in the community. The role of the government is the main factor in health management, both the central government and especially the role of local governments as a form of the decentralized development progress of a region (1). The public health center is one of Indonesia's most important public health service facilities. The public health center is a technical implementing unit for the district/city service responsible for organizing health development in a work area. Public Health Center is a functional organizational unit that carries out comprehensive, integrated, equitable health efforts that are acceptable and affordable by the community with active community participation and using the results of the development of appropriate science and technology, at a cost that the government and the wider community can bear to achieve optimal health status, without neglecting the quality of service to individuals (2,3).

Technology development is growing rapidly, affecting all aspects of life, including the health sector. A computer-based health information system produces easier, quality, and more relevant information (3-5). It can support management functions and overcome the increasing complexity of health data (6,7). The health center management information system (SIMPUS) aims to produce a system that can provide service workers with the information needed for patient management (8). Public health center management and health services based on information technology. As for the future, public health centers are also guided to use information technology related to efforts to improve health services in a comprehensive and integrated manner (9-11).

Data in the management process of public health centers are still less effective in terms of time. Then, bookkeeping the data of the community health center requires additional costs, such as the cost of purchasing several cabinets for filing files, paper costs, and others. Then, requesting the information is quite difficult for officers because they have to look at the data in their archives and have difficulty searching for the necessary data, such as data on employees, doctors, and patients. Making health center management information system (SIMPUS) using Codeigneter and ajax. The right of access to the system is granted to employees of the community health center data entry. A database system is a computerized system whose main purpose is to maintain processed data or information and to make information available when needed (12-14).

This health center provides care, treatment, hospitalization, emergency department, and others. However, in the management process, such as patient data, they still use paper containing patient data, which is recorded in archive form, and data on doctors, employees, and others. In recording data on a time basis, it is still less effective; for example, in finding patient data, doctor data, and other data, as well as in making reports or recording data on a timely basis, is still less effective and also requires additional

costs such as the cost of several cabinets for file storage, paper, and others. A health care provider is an individual health professional or a health facility organization licensed to provide health care diagnosis and treatment services, including medication, surgery, and medical devices (15).

The solution makes managing management data at the public health center easier to minimize errors in file archiving and data loss. The purpose of this research is to implement a health center management information system (SIMPUS) which includes recording data on lecturers, patients, and officers and making reports that are effective and efficient in terms of energy, time, and cost to implement in a community health center in terms of information on Tapung Health Centre that can be accessed by fast and efficient.

METHODS

The waterfall method is often called the classical life cycle, which describes a systematic and sequential approach to software development, starting with the specification of user requirements and then proceeding through the stages of planning, modeling, construction, and delivery of the system to customers/users (deployment), which ends with support for the complete software produced (16).

This analysis use performance, information, economy, control, efficiency, and services (PIECES). To obtain complete and accurate data, cooperation with related parties is needed, while the steps taken for data collection are observation of data collection through observation and recording of the symptoms or events investigated on the object of research directly. One example of the observations made is the health observation which is still done manually. Interview Data collection through face-to-face and direct question and answer with community health center officers and their patients. For example, regarding the data needed in the data collection process for the data needs the researcher desires. Literature study read and understand books or journals in completing this research, in this case, research on public health center management information system (SIMPUS).

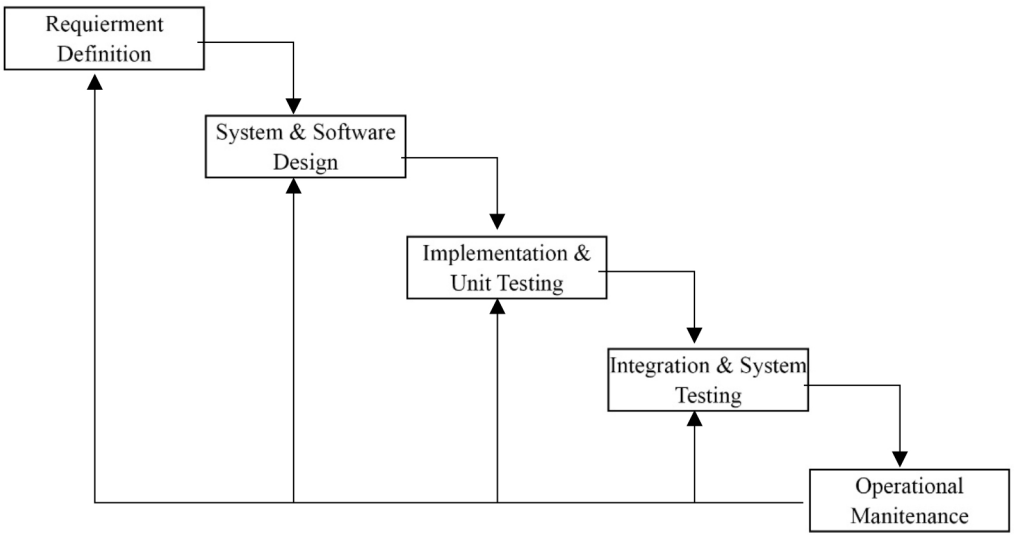


Figure 1. Waterfall.

The following is an explanation of the stages carried out in the waterfall model: step one Requirement, at this stage, the authors analyze what needs are needed in building this system and hold a data collection stage by meeting directly with the community health center, a question and answer process is also carried out regarding requests and wishes from the community health

center. System design includes planning a system that will be made based on the previous stage so that this system is made according to the needs of the community health center. Implementation of this process, the researcher, will start to make the information system. This stage starts with coding, which is the translation of designs that have been made into the computer language, creating databases, tables, and other functions using the software until the creation of a management information system for the community health center is completed and ready to be used. Integrating and testing. This stage is the testing stage or the testing stage of the system that has been created. Where all units developed in the implementation phase are integrated into the system after the tests carried out by each unit. After integration, the whole system is tested to check for any system failures.

RESULTS

The findings in the field are that the problem at the public health center occurs in data processing, where the complete process takes a long time and then causes delays in processing the management data of the Tapung Health Center. Therefore, the data processing results at the public health center are less relevant. Management data processing will cause problems because data processing is still done manually. The system used at the Tapung Health Center is still simple, using files on paper and folders to process management data at the Tapung Health Center, so a budget is needed. Themselves for the purchase of stationery and the cost of spending is getting bigger. So it is necessary to change the system to control expenses.

This stage is the activity of making a system or application using the help of software and hardware, following the analysis and design to produce a system that works.

Furthermore, an evaluation of the test results is carried out. If the test results have errors, then improvements are made. This evaluation is carried out to determine whether the system is as desired. After repairs and modifications to the system are made, the system can already be operated.

Figure 2. Login Menu Display.

This menu has two inputs: the username and password to enter the application. The entered username and password will be matched to the data contained in the database. If the data match, the user can enter the system, but if the data is not found, an error message will appear that the username and password are incorrect.

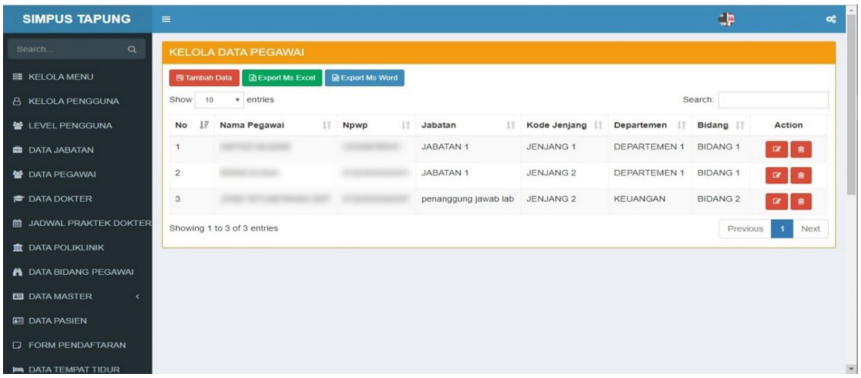


Figure 3. Employee Data Menu.

This menu will display employee data stored in the database. The data to be displayed is the employee's name, the number of the taxpayer participant, the position, code level, department, and field. There are also two buttons, namely, edit and delete. Edit is used to change employee data, and delete is used to delete employee data.

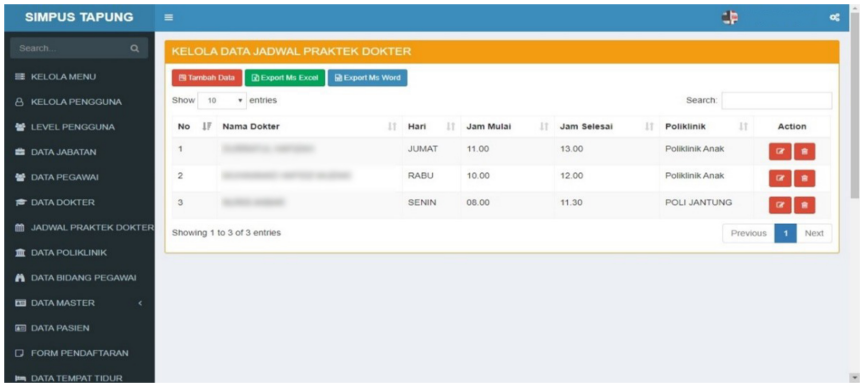


Figure 4. Display Menu Doctor Practice Schedule Data.

This menu will display the doctor's practice schedule data. The data displayed is the doctor's name, day, start time, end time, and polyclinic. There are also two buttons in this menu: edit and delete. Edit is used to change the doctor's practice schedule data, while delete is used to delete the doctor's practice schedule data

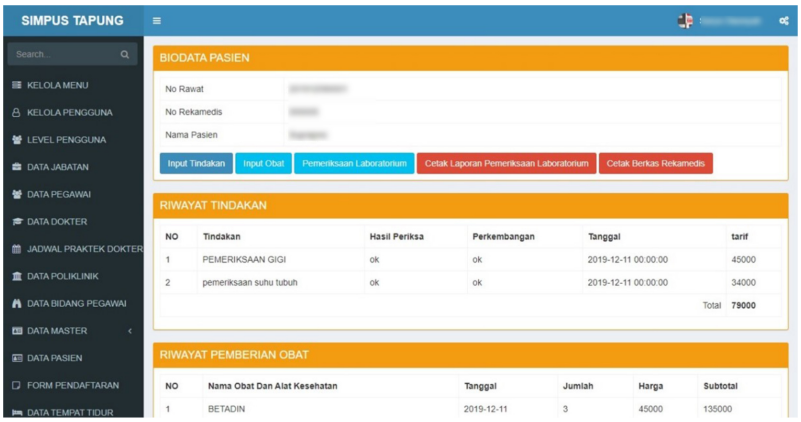
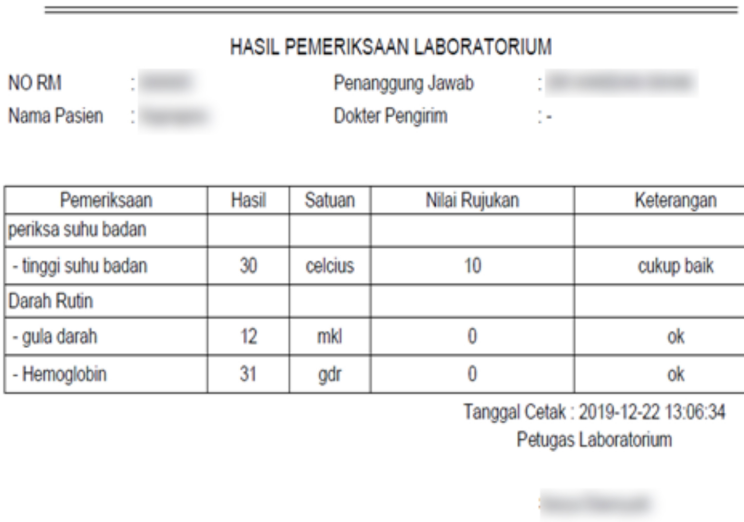


Figure 5. Action Menu.

In this menu, some information is displayed: patient biodata, action history, and drug administration history. The patient's biodata section has five buttons: action input, drug input, laboratory examination, print laboratory examination report, and print medical record file. Action input is used to input any actions carried out on the patient. Drug input is used to input any drug data given to the patient. Laboratory tests are used to input data on the results of laboratory tests that the patient has carried out, print out laboratory examination reports used to print the results of the laboratory examination input, and print the medical record

file used to print the patient's medical record file document. The action history section contains action data, examination results, progress, date of examination, and tariffs charged. In the history of drug administration, there are data on names of drugs and medical devices, date of administration of drugs, quantities, prices, and subtotals.



HASIL PEMERIKSAAN LABORATORIUM

NO RM : [redacted] Penanggung Jawab : [redacted]

Nama Pasien : [redacted] Dokter Pengirim : -

Pemeriksaan	Hasil	Satuan	Nilai Rujukan	Keterangan
periksa suhu badan				
- tinggi suhu badan	30	celcius	10	cukup baik
Darah Rutin				
- gula darah	12	mkl	0	ok
- Hemoglobin	31	gdr	0	ok

Tanggal Cetak : 2019-12-22 13:06:34

Petugas Laboratorium

[redacted]

Figure 6. Laboratory Examination Output Display.

This Output Report is a Patient Examination Report Display that explains all examinations' details. This report will show what examinations were carried out, the examination results, units, reference values, and a description of the patient's examination results.

Testing is carried out using the Blackbox Testing method, which is carried out only by observing the execution results through test data and software functional checkers using specific email and password. By using the Blackbox method.

Table 1

Table Test

Scenario Test	Expected Results	Test Results	Conclusion
Username and Password that are not registered	The system will refuse and show the message "email or password you entered is incorrect."	In accordance Hope	Valid
Correct username and incorrect password registered	The system will refuse and show the message, "The password you entered is incorrect."	In accordance Hope	Valid
Username that is not correct and registered password	The system will reject and display the message, "The username you entered is incorrect."	In accordance Hope	Valid
Registered Username and Password	The system will accept and enter to system	In accordance Hope	Valid

DISCUSSION

Existing data still uses archives or files. Management data has not been well structured as in employee and patient data, so the complete process requires excessive resources. And the Tapung Health Center has not been able to provide good service. It takes a long time to process the Tapung Health Center management data, which has a lot of archives piled up in books.

Health Information System (SIK) Public health center or called health center management information system (SIMPUS) aims to produce a system that can provide the information needed for patient management for service workers, community health centers, and health services based on information technology. Furthermore, accurate data and information from the results of the activities of the Community Health Center become a source of decision-making for regional and central policies. As for the future, community health centers are also guided to use information technology related to efforts to improve health services in a comprehensive and integrated manner (2).

Some of the advantages that can be obtained by implementing the Public Health Center Management information system are the ease for officers to obtain information without having to search data one by one. In addition, convenience for patients will be responded to quickly and efficiently. Furthermore, this system can minimize patient queuing in inputting data and Structured data storage because the public health center management information system uses a database stored on a computer (17).

The test results using the black box method show that the system runs well without errors, where all features run according to their respective functions without an error message appearing. The researcher's opinion is that the data management information system application design will minimize errors in file archiving and data loss. Then, this personnel data management information system application can run well with black box testing.

CONCLUSION

The design of this management data management information system application aims to make it easier to manage management data at the Health Center. It can minimize errors in archiving files and data loss. From the test results using the black box, this personnel data management information system application can run well, free from script errors, and functionally produce the expected results as for suggestions. For the next system development, it is better to create an Employee Work Structure (SKP) that all employees can access. The next system development should include transaction, financial, and banking processes so that it becomes a complex system.

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The effect of warm ginger on the frequency of nausea and vomiting among pregnancy women

El efecto del jengibre tibio en la frecuencia de náuseas y vómitos en mujeres embarazadas

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SUMMARY

Introduction: *Nausea and vomiting occur commonly during pregnancy and cause inconvenience among pregnant women. Non-pharmacological therapy with warm ginger was used in this quantitative study to relieve nausea and vomiting in pregnant women. The study aimed to determine the effect of using warm ginger on nausea and vomiting in pregnant women.*
Methods: *Quasi-experiment design was used in this study with pre and post-test of 31 respondents in the control group and 31 respondents in the intervention group. The respondent is a pregnant woman of 6-16 weeks and experiences nausea and vomiting. The pregnancy Unique Quantification of Emesis and Nausea (PUQE) questionnaire was used in this study to show nausea and vomiting scores experienced pre and post-intervention warm ginger. The data were analyzed by the Wilcoxon statistical test.*
Results: *The results showed a difference after being given intervention with a p-value less than 0.05, which is 0.0001. An amount of 50 mg of dried ginger consumed for four days with a dose of 2 tablespoons dissolved in 200 mL of warm water and drunk in the morning and evening reduce the frequency of nausea and vomiting in the pregnant woman.*
Conclusion: *This study showed a difference in the frequency of nausea and vomiting of pregnant women before and after consuming warm ginger. Using ginger as a complementary intervention relieve nausea and vomiting in pregnant women.*

Keywords: *Ginger, pregnant woman, vomiting.*

RESUMEN

Introducción: *Las náuseas y los vómitos ocurren comúnmente durante el embarazo y causan molestias entre las mujeres embarazadas. En este estudio cuantitativo se utilizó una terapia no farmacológica con jengibre tibio para aliviar las náuseas y los vómitos en mujeres embarazadas. El estudio tuvo como objetivo determinar el efecto del uso de jengibre tibio sobre las náuseas y los vómitos en mujeres embarazadas.*
Métodos: *En este estudio se utilizó un diseño de cuasi-experimento con pruebas previas y posteriores de 31 encuestados en el grupo de control y 31 encuestados en el grupo de intervención. La encuestada es una mujer embarazada de 6 a 16 semanas y experimenta náuseas y vómitos. En este estudio se utilizó el cuestionario*

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de cuantificación única de emesis y náuseas (PUQE) del embarazo para mostrar las puntuaciones de náuseas y vómitos experimentadas antes y después de la intervención con jengibre tibio. Los datos fueron analizados por la prueba estadística de Wilcoxon.
Resultados: *Los resultados mostraron una diferencia después de recibir la intervención con un valor de p menor a 0,05, que es 0,0001. Cantidad de 50 mg de jengibre seco consumidos durante cuatro días con una dosis de 2 cucharadas disueltas en 200 mL de agua tibia y bebido por la mañana y por la noche reducen la frecuencia de náuseas y vómitos en la mujer embarazada.*
Conclusión: *Este estudio mostró una diferencia en la frecuencia de náuseas y vómitos de las mujeres embarazadas antes y después de consumir jengibre tibio. El uso del jengibre como intervención complementaria alivia las náuseas y los vómitos en mujeres embarazadas.*

Palabras clave: *Jengibre, mujer embarazada, vómitos*

INTRODUCTION

The maternal mortality rate (MMR) in developing countries in 2015 was 239 per 100 000 live births, while in developed countries, it was 12 per 100 000 live births (1). Indonesia, as a developing country, has a maternal mortality rate of 305 per 100 000 live births (2). Pregnancy is a natural process experienced. It needs special care to last with the good because it contains an embryo in the body after the union of the egg and spermatozoa (3-5). Pregnancy is characterized by amenorrhea, nausea and vomiting, cravings, syncope or dizziness, tight breasts, frequent urination, constipation or constipation, pigmentation skin, epulis, and varicose veins or apparition vessels blood veins (6–9). There is a possibility that a first-trimester pregnancy will experience nauseous with or without vomit (10,11). These symptoms begin around the 6th week of pregnancy and usually decrease dramatically in the late trimester first (around the 13th week) (12,13),

In pregnant women, there are changes in the mother's body that can cause discomfort. One of the discomforts is nausea and vomiting, known as emesis gravidarum. A number of 50 %-90 % of pregnant women experience emesis gravidarum, which can interfere with daily activities and can even be dangerous for the mother and fetus (14,15). These symptoms begin around the first week of pregnancy and decrease dramatically at the end of the first trimester (week 13) (16). The treatment given by health workers for nausea and vomiting experienced by pregnant women is currently very diverse, ranging from counseling to pharmacological and non-pharmacological treatment (17). One of the recommended non-pharmacological actions is consuming processed ginger in cakes, drinks, sweets, and aromatherapy (18). Many studies have proven that processed ginger is efficacious in reducing nausea and vomiting. For example, one of the studies conducted by Herni stated that ginger aromatherapy affected reducing nausea and vomiting in pregnant women (16).

Ginger is a plant with a million properties known for a long time. The rhizome has many benefits, including as a spice for cooking, drinks, and sweets, and is also used in traditional medicinal herbs (19). There are several terpene components in ginger, such as β-bisabolene, α-curcumene, zingiberene, α-farnesene, and β-sesquiphellandrene, which are considered to be the main constituents of ginger essential oils. In addition it contains gingerol, vitamin A, and bitter resin, which can block serotonin, a neurotransmitter that is synthesized in neuro serotonergic's in the central nervous system and enterochromaffin cells in the digestive tract. It is believed to be able to provide a comfortable feeling in the stomach to overcome nausea and vomiting (17).

The advantage of ginger is that it contains essential oils, which have a refreshing effect and block the gag reflex, gingerols can improve blood circulation, and nerves work well. In addition, the fragrant aroma of ginger produced by essential oils and oleoresin causes a spicy taste that warms the body. This is supported by research conducted by the University of Myland Medical Center, which explains that consuming 1 gram of ginger extract daily during pregnancy is a safe and effective way to reduce nausea and vomiting that is usually felt in the morning (18).

Based on a preliminary study conducted by the Dayak community in Tarakan, they believe that consuming ginger in pregnant women can overcome nausea and dizziness and can launch the birthing process. The Dayak tribe usually consumes ginger by preparing a ginger concoction

which is added with aromatic ginger and brown sugar and mixed into herbal medicine. The incidence of emesis gravidarum in pregnant women throughout 2022 (January-February) conducted brief interviews with several pregnant women. Around 60 % of mothers said they consumed ginger to relieve nausea and vomiting. This study identified the effect of consuming warm ginger on the frequency of nausea and vomiting in pregnant women.

METHODS

This research was a quantitative study using a quasi-experiment pre-post test with a control group design. This design was used to determine differences in the frequency of nausea and vomiting during pregnancy before and after consuming ginger. The sampling method was a consecutive sampling method with criteria of gestational age 6-16 weeks and experiencing nausea and vomiting. The sample of this study was 62 respondents, divided into 31 respondents in the intervention group and the control group (31 respondents). In the intervention group, 31 respondents were given 50 mg of dried ginger consumed for four days with a dose of 2 tablespoons dissolved in 200 mL of warm water and drunk in the morning and evening in the treatment group. At the same time, the control group was not given it. Then given an observation sheet in the form of a checklist per day, which must be filled out. Family or husband support is needed to remind respondents to consume ginger for four days. After four days, the observation sheet was filled in by researchers and then followed by the PUQE questionnaire to see the difference in the score of nausea and vomiting after the intervention. The independent variable in this study was the administration of ginger, and the dependent variable was nausea and vomiting in pregnant women.

The instrument in this study was Birkeland (2015) modified and translated to the Indonesian version (20). Characteristics Respondents in this study were gestation age, education, parity, and age. The independent variable in this study was ginger. While the dependent variable was the frequency of nausea and vomiting. There were confounding variables in this study, including husband support and physical illness. Respondents were analyzed by researchers using the Pregnancy Unique Quantification of Emesis and Nausea (PUQE) Questionnaire to show nausea and vomiting scores experienced in pregnancy (20). The questionnaire has three questions related to how long the mother feels nausea in a day, how long the mother experiences vomiting in a day, and how many times a day she experiences vomiting or shortness of breath when not doing activities. Each question has five answer choices. This questionnaire was used pre and post-intervention to show the difference in the frequency of nausea and vomiting during teenage pregnancy before and after consuming ginger.

After the data was collected, the next step was data processing and analysis. The homogeneity test in this study was applied to see the data variance between the intervention group and the control group. Univariate analysis in this study was described in mean (median) or median, standard deviation (SD), and maximum, and minimum values for numerical data such as maternal age and frequency of nausea and vomiting. Categorical data is explained using proportions and percentages such as the provision of honey ginger biscuits, gestational age, parity, education, and pregnancy planning. Bivariate analysis was conducted using a Wilcoxson (paired test). The use of this test was because the research design used a pre-post test with a control group design with numerical. This study applies ethical principles and has obtained ethical approval at Universitas Borneo Tarakan, with ethical test number 06/KEPK-FIKES UBT/IV/2022.

RESULTS

The following tables presented the study findings, including the homogeneity test of the characteristic respondents, the difference in frequency of nausea and vomiting in pregnancy before and after consuming ginger in the intervention group, the difference in mean frequency of nausea and vomiting between the intervention group and the control group, the difference in the frequency of nausea, vomiting before and after consuming ginger based on the characteristics of respondents in the intervention group.

The subjects of this study were 62 pregnant women who had nausea and vomiting during this pregnancy at Tarakan, North Kalimantan, in 2022. The frequency distribution of research subjects showed that most of 16 (51.6 %) were pregnant more than once or multigravida in the control group, and 21 (67.7 %) were pregnant more than once or multigravida in the intervention group. Most of the pregnant women of reproductive age 20-35 years 24 (77.4 %) in the control group and 29 (93.5 %) in the intervention group. Most of the pregnant women had junior school, 20 (64.5 %) in the control group and 15 (48.4 %) in the intervention group (Table 1)

Table 1

Characteristic of responden

Characteristics	Control	Group	Intervention	Group
Parity				
Primigravida	15	48.4	10	32.3
Multigravida	16	51.6	21	67.7
Age (years)				
<20 and >35	7	22.6	2	6.5
20-35	24	77.4	29	93.5
Education				
Elementary school	6	19.4	9	29.0
Junior school	20	64.5	15	48.4
High school	5	16.1	7	22.6
Total	31	100.0	31	100.0

Table 2 showed that based on the results of the Kolmogorov-Smirnov normality test. It was found that the data were not normally distributed because there were data < 0.05 in the post-experimental data, while the data were normally distributed, i.e.> 0.05. The normality test uses the Kolmogorov-Smirnov because the sample is > 50 respondents.

Table 2

Homogeneity Test

Variable	Kolmogorov-Smirnov Statistic	p-value
Pre experiment	0.137	0.144
Post experiment	0.187	0.008
Pre control	0.149	0.077
Post control	0.153	0.064

Based on the results of the Wilcoxon test (Table 3), there was a difference after being given treatment/experiment with a p-value <0.05, which is 0.0001, so it can be concluded that there was an effect of using the method after being given treatment.

Table 3

	Experiment					Control				
	n	Min	Max	Mean	SD	n	Min	Max	Mean	SD
Pre	31	2	12	8.26	2.408	31	5	12	8.58	1.785
Post	31	2	6	3.84	1.157	31	5	11	8.55	1.710
Negative rank	19.68									
Positive rank	649.50									
Z-hitung	-4.9991									
p-value	0.000									

DISCUSSION

The results showed that after eight times interventions for four days, the majority of pregnant women in the third-trimester experience reduced nausea and vomiting. Based on the results, there was a difference after being given warm ginger. The PUQE score in the intervention group before being given warm ginger was 12, and after being given warm ginger, the PUQE score was 6. In pregnant women, emesis gravidarum or nausea and vomiting is the most common symptom in the first trimester, around 50 %-90 % (21). Ginger can prevent nausea and vomiting because ginger can be a barrier to serotonin, a chemical that can cause the stomach to contract, causing nausea (22). This research shows the truth of the results study that in content ginger is an essential oil containing the compound gingerol capable of reducing nausea and vomiting.

The results of this study are consistent with other studies that stated that ginger effectively treats nausea and vomiting symptoms that arise during pregnancy. Ginger has the effect of relaxing and weakening the muscles in the digestive tract, thereby reducing nausea and vomiting in pregnant women. The use of various ginger products greatly helps pregnant women reduce the nausea and vomiting that they complain of (23). The results of this study are in line with those carried out by a previous study where regular consumption of ginger has been shown to reduce nausea and vomiting among pregnant women as the effect of ginger (23).

The results of this study showed that there are significant differences in the frequency of nausea and vomiting of pregnant women before and after consuming ginger dried. The results of this study indicate a change in the average frequency of lower nausea and vomiting after consuming ginger. This study's results align with previous studies conducted on 62 pregnant women who were given ginger. The study showed a decrease in nausea as much as 85 % in nausea scores and by 50 % in vomiting scores (24). These results reinforce this study that ginger is effective in reducing nausea and vomiting in pregnancy. Another research that is in line with this research is a study conducted by 32 pregnant women in the intervention group given five ginger and honey biscuits to consume as many as five biscuits a day for four days. Ginger contains essential oil and oleoresin content in addition ginger also contains analgesic, anti-inflammatory, antithrombotic, and cholesterol-lowering (25). Therefore the antiemetic effect is thought to be caused by work anticholinergic and antihistamine, where the antiemetic reduces nausea and vomiting.

CONCLUSION

In conclusion, there are differences in the frequency of nausea and vomiting among pregnant women before and after consuming warm ginger. This research recommends using ginger as an alternative intervention to relieve nausea and vomiting among pregnant women.

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Effectiveness of 3D Pageflip Professional electronic module to prevent urolithiasis recurrent among urolithiasis patients

Eficacia del módulo electrónico 3D Pageflip Professional para prevenir la recurrencia de la urolitiasis en pacientes con urolitiasis

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SUMMARY

Introduction: *Non-communicable diseases are one of the targets of the Sustainable Development Goals (SDGs), including health problems related to urinary tract stones (urolithiasis). Urolithiasis has a high recurrence rate within 3-5 years after recovery from the disease. This study aimed to develop an Electronic Module (E-module) as a medium for preventing urolithiasis patients and assessed the effectiveness of this professional E-Module 3D pageflip media.*
Methods: *This type of research was research and development. The E-module development model in this study was carried out in 3 stages, namely define (preliminary study in the form of field studies and literature studies), design (designing the e-module), and development (feasibility test and effectiveness test 3D pageflip professional e-module). In the development stage, the subject of this research was taken using a purposive sampling technique, totaling 150 respondents with the criteria of patients with urolithiasis at the urology poly. To be able to measure the effectiveness of the E-module, the instrument used was a questionnaire using a Likert scale. The test was carried out using the Paired Sample T-test with a level of 5 %.*
Results: *Respondents were dominated by age in the range of 46-62 (55.3 %) and male (65.33 %). The E-module feasibility test was carried out with an assessment from the expert, which includes two aspects: the expert validation material, which showed a score of 94 (very good), and the media expert test, which scored 95.7 (highly feasible). Professional pageflip 3D e-module can improve knowledge (p-value = 0.0001), attitude (p-value = 0.0001), and behavior to prevent recurrence of urolithiasis (p-value = 0.0001).*
Conclusion: *This study showed that the professional pageflip 3D E-module can improve knowledge, attitude, and behaviour to prevent urolithiasis. The use of E-modules in providing information to the public provides an opportunity to understand better the concept of the material by studying the text because E-modules provide opportunities for people with urolithiasis to learn independently.*

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RESUMEN

Introducción: *Las enfermedades no transmisibles son una de las metas de los Objetivos de Desarrollo Sostenible (ODS), incluidos los problemas de salud*

relacionados con los cálculos en las vías urinarias (urolitiasis). La urolitiasis tiene una alta tasa de recurrencia dentro de los 3-5 años posteriores a la recuperación de la enfermedad. Este estudio tuvo como objetivo desarrollar un módulo electrónico (módulo E) como un medio para la prevención de pacientes con urolitiasis y evaluó la efectividad de este medio de cambio de página 3D E-Module profesional.

Métodos: *Este tipo de investigación fue investigación y desarrollo. El modelo de desarrollo del módulo electrónico en este estudio se llevó a cabo en 3 etapas, a saber, definición (estudio preliminar en forma de estudios de campo y estudios de literatura), diseño (diseño del módulo electrónico) y desarrollo (prueba de factibilidad y prueba de efectividad 3D pageflip módulo electrónico profesional). En la etapa de desarrollo, el tema de esta investigación fue tomado mediante una técnica de muestreo intencional, totalizando 150 encuestados con el criterio de pacientes con urolitiasis en el poli de urología. Para poder medir la eficacia del módulo E, el instrumento utilizado fue un cuestionario en escala tipo Likert. La prueba se llevó a cabo utilizando la prueba T de muestras pareadas con un nivel del 5 %.*

Resultados: *Los encuestados estuvieron dominados por la edad en el rango de 46-62 (55,3 %) y el sexo masculino (65,33 %). La prueba de viabilidad del módulo E se realizó con una valoración del experto, que incluye dos aspectos: el material de validación del experto, que arrojó una puntuación de 94 (Muy bueno), y la prueba del experto de medios, que obtuvo un puntaje de 95,7 (altamente factible). El módulo electrónico profesional pageflip 3D puede mejorar el conocimiento (valor p = 0,0001), la actitud (valor p = 0,0001) y el comportamiento para prevenir la recurrencia de la urolitiasis (valor p = 0,0001).*

Conclusión: *Este estudio demostró que el módulo E profesional pageflip 3D puede mejorar el conocimiento, la actitud y el comportamiento para prevenir la urolitiasis. El uso de módulos electrónicos para proporcionar información al público brinda la oportunidad de comprender mejor el concepto del material mediante el estudio del texto porque los módulos electrónicos brindan oportunidades para que las personas con urolitiasis aprendan de forma independiente.*

Palabras clave: *3D pageflip, módulo electrónico, ODS, urolitiasis.*

INTRODUCTION

Health issues in the SDGs are one of the important goals across people's life. Goal number 3 ensures a healthy life and promotes prosperity for all people of all ages (1). There are 38 SDGs targets in the health sector that need to be realized, one of which is non-communicable diseases (1). One of the non-communicable diseases is Urinary Tract Stones (Urolithiasis). Urolithiasis is a pathological condition due to the presence of hard masses such as stones that form along the urinary tract and can cause pain, bleeding, or infection in the urinary tract (2–4). Urinary stones are one of the biggest diseases in the field of urology that many people suffer from (5,6). The prevalence of urolithiasis has increased significantly in recent decades in most Asian countries, such as China (from 4 % to 9.0 %), South Korea (from 3.5 % to 11.5 %), Thailand (from 1.4 % to 16.9 %), Saudi Arabia (from 6.8.% to 19.1 %), Iran (from 5.7 % to 8.1.%) and Israel (from 1.2 % to 9.2 %) (1).

According to Zamzami in 2018, urolithiasis is the most common disease the Indonesian people suffer in the urology field (7). In Indonesia, the incidence of urinary tract stones is still unknown, but it is estimated that there are 170 000 cases per year, and the prevalence of the Indonesian population suffering from kidney stones is 0.6 % or 6 per 1 000 population. This shows that cases of urinary tract stones are still high. It is also estimated to increase rapidly every year. The prevalence of urolithiasis in Banten Province was reported to be as much as (0.4 %) (1). The number of urolithiasis sufferers from January to August 2020 was 985 (1). The prevalence of kidney stones increased with increasing age, highest in the 55-64-year age group (1.3 %), and decreased slightly in the 65-74 year age group (1.2 %) and 75 years (1.1 %). The prevalence was higher in men (0.8 %) than in women (0.4 %). The highest prevalence is in the population who have not attended school and have not graduated from elementary school (0.8 %) and are self-employed (0.8 %). The economic status is almost the same, from 131 quintiles of ownership to the lower middle-class index (0.6 %). The prevalence in rural areas is the same as in urban areas (0.6 %) (1).

One of the efforts made to improve the quality of knowledge about a disease is to be creative and innovative in providing educational counseling to increase understanding (8-10). The success of health education in the community depends on the learning component. Health education media is one component of the learning process.

Attractive media will provide confidence so that cognitive effects and psychomotor changes can be accelerated (11,12). Efforts can be made by conducting counseling and providing an effective learning module (13,14). Modules are written and arranged in such a way that the material delivered in teaching and learning activities is always directed to the objectives to be achieved, which have been clearly and specifically formulated. Modules can also be used as alternative learning media (15). A learning module is a small unit of teaching and learning program, which can be learned by students (self-instructional) or by themselves sendiri (1,16).

Computers are widely used as learning media. Computers are used to deliver lesson content and provide exercises (17). One computer-based learning media that can be used in teaching and learning activities is the E-module (Electronic Module). E-module is a module in an electronic format that is run by a computer (18,19). Electronic modules can display text, images, animations, and videos through electronic devices such as computers. Electronic modules can reduce the use of paper in the learning process. In addition, this electronic module is expected to be used as an alternative to efficient and effective interactive learning. The existence of E-modules is expected to be a new source of learning for the community, which is then expected to increase knowledge, attitudes, and behaviour. Based on this description, the researchers created a learning E-module that can be used by people with urolithiasis in hospital urology polyclinics.

METHODS

This research is Research and Development type. This study's E-module Development Model was carried out in 3 stages: Define, Design, and Development. The Define stage aims to determine and define the community's needs by analyzing the material's objectives and limitations for urotiliasis disease. In this stage, a preliminary study is carried out, which includes field studies and literature studies. At the field study stage, observations were made to analyze the condition of the people in Tangerang, Indonesia, and information materials used by the community to determine urotiliasis. Literature studies in the form of theoretical studies include the development of research theories, teaching materials in the form of E-modules, urolithiasis disease materials, and relevant previous research studies.

This design phase aims to design an E-module. Thus, a design form of an E-module is produced. At this stage, planning and preparation of the Professional 3D Pageflip E-module and concept understanding instruments and research instruments are carried out. As a result, a professional 3D pageflip e-module was developed based on urolithiasis disease material. At this stage, realize the planning results at the design stage. The Professional 3D Pageflip E-module design that has been conceptualized is then developed by going through the steps of the expert validation stage and the field implementation stage. In the development stage, the subject of this study was taken using a purposive sampling technique totaling 150 respondents, with the criteria of patients with urolithiasis at the Urology Poly. To measure the effectiveness of the E-module, the instrument used is a Likert scale questionnaire. The test was carried out using the Paired Sample T-test with a level of 5 %.

The instrument was used in the form of a questionnaire using a Likert scale. There are three types of data collection instruments in this development research, namely: (1) an instrument to analyze teaching materials used so far in the learning process, namely interview guidelines, and (2) an E-module instrument 3D Pageflip Professional, which is given to the public and a team of experts (media experts and material experts) and (3) a questionnaire instrument to determine the effectiveness of the 3D Pageflip Professional E-module. This study, to measure the effectiveness of the professional 3D Pageflip-based E-module, is compared with the results of the knowledge behaviour questionnaire and the sample attitude (pretest-posttest) taught using the professional 3D Pageflip E-module. The statistical test was carried out using the paired sample t-test with a level of 5 %.

This research has obtained ethical approval from the Health Research Ethics Commission, Faculty of Health Sciences, Universitas Islam Negeri Syarif Hidayatullah, Jakarta, with the number Un.01/F.10/KP.01.1/ KE.SP/08.08.081/2021.

RESULTS

Respondents of Characteristics

Table 1 showed respondents in this study were dominated by the age group between 46-62 years of 83 people (55.3 %) and male sex of 98 people (65.33 %).

Table 1

Characteristics of Respondents Based on The Demographic Profile (n = 150)

Demography variable	n	%
Age (year)		
18-30	11	1.36
31-45	56	37.3
46-62	83	55.3
Sex		
Male	98	65.33
Female	52	34.67
Total	150	100.00

Urolithiasis Disease Material Analysis

The results of this analysis can be used as a guide in developing indicators and determining the limits of e-module material. The public should understand the causes and procedures for preventing urolithiasis on urolithiasis. However, the lack of sources of information obtained by the public about urolithiasis disease so that people are indifferent to the dangers that will lurk if they have this disease. The 3D Pageflip Professional E-Module provides information regarding the concept of urolithiasis, its dangers, and ways to prevent it. This e-module will provide information electronically that can be accessed using a mobile phone.

Pageflip Professional 3D E-Module Prototype

The chemistry E-module developed is a professional pageflip 3D E-module where patients can understand the concept of urolithiasis disease. The pageflip professional 3D E-module is structured around the steps to prevent the recurrence of urolithiasis for survivors.

Design

At the design stage of the professionally developed 3D pageflip E-module, it begins with an "explanation" for each sub-chapter. For example, the explanation of urolithiasis disease in the e-module is intended to provide an understanding to the people of Tangerang city about Urolithiasis disease. The design of a professional 3D pageflip e-module on urolithiasis can be seen in Figures 1 and 2.

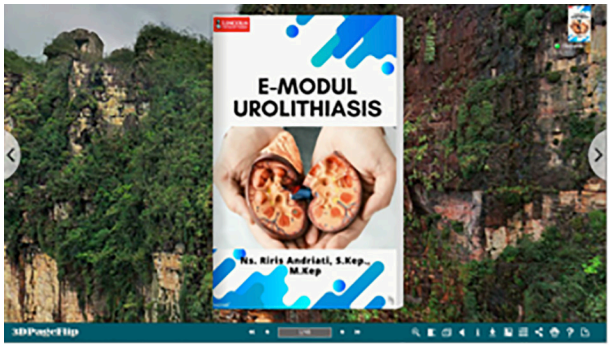

Figure 1. Urolithiasis E-Module Design View.

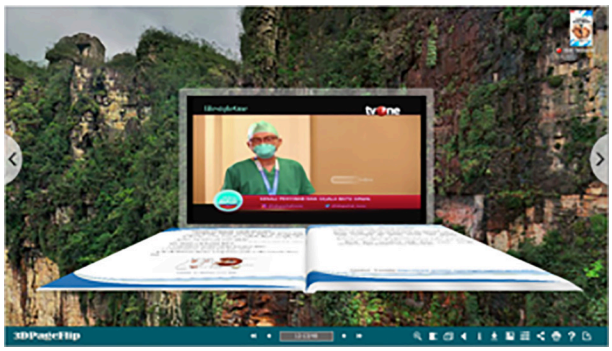

Figure 2. Video Display About Urolithiasis.

In the next stage of evaluation be able to see the public's understanding of the use of professional pageflip 3D E-modules. The formative test consists of 5 multiple-choice questions and is

equipped with an assessment so that people can measure their abilities related to urolithiasis. In other words, the formative test contained in the e-module is a requirement that must be met by people experiencing urolithiasis to find out whether people experiencing urolithiasis have mastered the material (Figure 3).

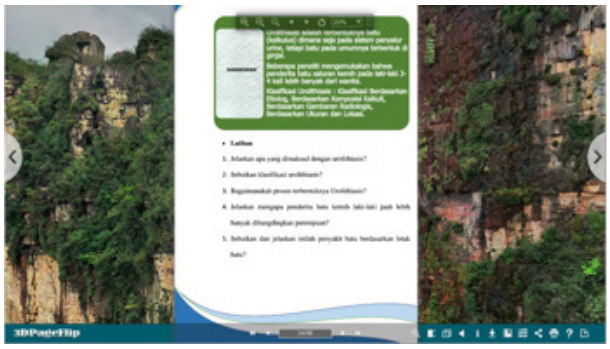

Figure 3. Formative Evaluation in Each Section of The E-Module.

Development

Pageflip professional 3D E-module Feasibility Test

Researchers undertook validation activities by asking several validator experts, namely an expert to assess the media and an expert to assess the material. Based on the data from the validation results and suggestions from the expert team, a revision was made to the page flip professional 3D E-module product. Validation is declared complete if the quality of the E-module product has been declared feasible by a team of experts.

Material Expert Validation

Material expert validation is carried out by filling out an assessment questionnaire sheet on each assessment aspect, which consists of 3 aspects. There are several statements from 10 statements filled out by material experts in each aspect. The material expert in this research is Dr. Edhi Hapsari Mulyoningtyas, Sp.U. Based on the results of the material expert feasibility test by dr. Edhi Hapsari Mulyoningtyas, Sp. U obtained several inputs; namely, the material needs to be deepened to provide holistic knowledge to the community regarding urolithiasis. The results of the material validation phase 1 obtained a score of 25, with a maximum score of 50, then the percentage = 25/50 *x* 100 % = 51,4 %. Based on these calculations, the presentation value of the media validation results is 50.0 %. With fewer categories (Sugiyono, 2012). So that some aspects need to be revised according to material experts.

The material expert test was carried out in stage 2 to see the feasibility of the developed e-module. The results of the second phase of material validation obtained a score of 47, with a maximum score of 50, then the percentage = 47/50 *x* 100 = 94,0 %, which means it is highly feasible.

Media Expert Test

In the next stage, the pageflip professional 3D E-Module tests the feasibility of media experts. In this section the media expert Dr. Dirgantara Wicaksono, M.Pd. The results of the media validation stage 1 obtained a score of 36, with a maximum score of 80, then the percentage = 36/70 x 100 % = 51.4 %. Based on these calculations, the presentation value of the media validation results is 51.4 %. With fewer categories (Sugiyono, 2012). So that some aspects need to be revised according to media experts, and some of the inputs given by media experts were the need to improve the E-module cover, which looks less sharp, and the quality of the displayed image is not good.

After several revisions, it was adjusted with input from media experts. The next step is the media expert validation test stage 2. The results of the second stage of media validation get a score of 67, with a maximum score of 70, then the percentage = 67/70 *x* 100 % = 95.7 %, which means it is highly feasible.

Test the Effectiveness of 3D Page Flip Professional through the Quantitative Stage

A difference test was conducted using the T-Test Paired to see the effectiveness of 3D Page Flip Professional. Before testing, it was necessary to test for normality. The normality

test was used to determine the knowledge, attitudes, and behaviour of preventing disease recurrence in the Tangerang City community using the professional 3D page flip E-module that was normally distributed. The normality test criteria were declared normal if the data had a significance > 0.05.

Table 2 shows that the data was normally distributed. Thus, the test of the difference between before and after the professional page flip 3D E-module used the Paired T-Test test. Table 3 shows the differences in knowledge, attitudes, and behaviour before and after exposure to the E-module.

Table 2

Normality Test of Knowledge, Attitude, and Behavior Before and After Using Page Flip Professional's 3D E-module

	Factors	p-value
Knowledge, Attitudes, and Behaviour Prevention of Recurrence of Urolithiasis Disease	Knowledge Pre-test	0.391
	Knowledge Post-test	0.613
	Attitude Pre-test	0.107
	Attitude Post-test	0.107
	Behaviour Pre-test	0.215
	Behavioural Post-test	0.391

Table 3

Differences in Knowledge, Attitudes, and Behavior of the Tangerang City Community Using Before and After the Professional 3D Page Flip E-Module

Variable		n	Mean	Min-Max	p-value
Knowledge	Pre Test	150	48.8	27 – 77	0.0001
	Post Test	150	69.64	52 - 80	
Attitudes	Pre Test	150	49.90	41 – 58	0.0001
	Post Test	150	74.90	66 - 83	
Behaviour	Pre Test	150	50.83	44 – 58	0.0001
	Post Test	150	75.83	69 - 83	

DISCUSSION

The feasibility trial of the Professional 3D Page Flip E-module used in the intervention with the assessment method from the expert showed a value of 'Excellent' in two aspects, namely expert validation material and expert test media. The final result of the assessment must have gone through several stages until it was finally declared worthy of being used as an educational medium for clients with urolithiasis. However, one of the assessment indicators is considered unfavorable. Improvements, such as the design display quality, the writing format, and the integration between the materials/activities, are needed. This is very important to consider in the educational element because interactive media (supported by attractive designs and displays) would help increase one's motivation to learn (20,21). The Centers for Disease Control and Prevention (2009) also strengthened by writing guidelines on how to deliver good education through the media should be able to adjust the size of writing that is comfortable for the target to read (22). In the context of this research, the client is expected to have a solid motivation to optimally utilize the E-modules provided so that their knowledge increases and their behaviour changes towards a healthier direction. To fulfil these achievements, the creation of standardized educational media is urgent and not to be ignored, especially if you

look at the clients in this study, which people in late adulthood dominate to the elderly who need comfort in reading with font sizes that should not be too small.

The knowledge level of clients in this study increased after being given intervention with Page Flip Professional 3D E-module media. This was in line with previous research, which showed that digital flipbooks could strengthen one's knowledge of the concepts presented (23). Another study also supported using E-modules, which impact increasing ability and even behaviour to solve a specific problem (24). Increased knowledge can be due to the brain's cognitive process, which tends to be easier to accept and understand information sourced from attractive visual displays. This indicates that increasing knowledge for clients in terms of health, especially the prevention of recurrence of urolithiasis, requires interactive and innovative media (not monotonous), especially the material presented is complex and closely related to daily life to modify lifestyle.

In addition to knowledge, the clients' attitudes in this study also proved to be more positive after being given the Page Flip Professional 3D E-module intervention. A changed attitude means that clients tend to be better able to make healthy life choices to prevent urolithiasis recurrence. This study was in line with Gustina and Wibowo in 2020 research which stated that digital flipbook media could affect the healthy attitude of teenagers (25). A healthy attitude begins with persuasive communication from the Professional 3D Page Flip E-module. The persuasive E-module is also supported by creative designs, attractive displays, and interactive word choices that have the potential to leave messages attached to the client's subconscious. If this happens, the client is unconsciously influenced to behave healthily, preventing the recurrence of urolithiasis.

Behavioural variables change after the client uses the Professional 3D Page Flip E-module. The behaviours referred to in this study were related to the actual application of activities to prevent the recurrence of urolithiasis, such as adequate fluid/hydration, physical activity, and proper diet consumption. This study was similar to a study from India, which stated that using flip books could change a person's behaviour to live a healthier life (26). The flipbook contains essential points of the messages to be conveyed and then packaged to be informative so that the process of cognition occurs more quickly. The knowledge inherent in the cognitive function then increases a person's self-awareness and guides them to act healthier. Another study by Maynastiti et al. in 2020 also explained that digital flipbooks could improve one's problem-solving skills (27). Problem-solving is also part of healthy behaviour closely related to preventing urolithiasis recurrence. An example of solving the problem in question is in the condition when the client can act to drink regularly according to fluid needs. On the other hand, the client also realizes that he did not care about hydration status in the past. This statement can indicate the importance of the Professional 3D Page Flip E-module, which acts as a medium to inspire/ initiate a person to behave healthier.

CONCLUSION

The Professional 3D Page Flip E-module has been assessed as feasible based on expert reviews to be used as an intervention medium to prevent urolithiasis recurrence. This E-module shows its effect on increasing knowledge and changing attitudes and behaviour towards being healthier in preventing urolithiasis recurrence. Therefore, it is highly recommended for nurses or health workers in hospital urology units apply this E-module as part of structured patient education. Further development is recommended to add online consultation features to maintain controlled healthy behaviour.

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ARTÍCULO ORIGINAL

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The relationship of skin integrity picture in stroke patients with the use of anti-decubitus mats at Hospital

Relación del cuadro de integridad de la piel en pacientes con accidente cerebrovascular con el uso de colchones antiescaras en el Hospital

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SUMMARY

Introduction: *Stroke is one of the non-communicable diseases which is the concern health problem in the community. Stroke is more common in various countries, both developed and developing countries, such as Indonesia. This study aimed to determine the skin integrity in stroke patients using anti-decubitus mattresses at the hospital.*
Methods: *This study was a quantitative research design using a cross-sectional design, namely non-experimental research, for the relationship between independent variables (risk factors) and effect variables by taking instantaneous measurements. The population in this study were stroke patients with decubitus injuries treated at a hospital. The sampling technique in this study is consecutive sampling based on a specific purpose or objective determined by the researcher. The sample in the study was 16 people. Analysis of univariate and bivariate data with fisher exact test results.*
Results: *The results of the study were the number of respondents who used an anti-decubitus mattress as many as 15 people (93.8 %) while those not using a mattress as many as one person (6.2 %) while the number of respondents based on skin integrity during less than seven days of treatment, namely improving as many as 15 people (93.8 %) while worsening as much as 1 person (6.2 %). Fisher's exact test analysis test obtained a p-value = 0.041.*
Conclusion: *There was a change in the degree of pressure sores in stroke patients using anti-decubitus mattresses at the hospital. It is hoped that there will be further research with a more significant number of samples with in-depth studies and controlling the factors that affect pressure sores.*

Keywords: *Anti-decubitus mattress, skin integrity, stroke.*

RESUMEN

Introducción: *El accidente cerebrovascular es una de las enfermedades no transmisibles, que constituye el problema de salud más temido en la comunidad. El accidente cerebrovascular es más común en varios países, tanto desarrollados como en desarrollo, como*

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Indonesia. Este estudio tuvo como objetivo determinar la integridad de la piel en pacientes con accidente cerebrovascular que utilizan colchones antiescaras en el hospital.

Métodos: *Este estudio fue un diseño de investigación cuantitativo utilizando un diseño transversal, es decir, una investigación no experimental, para la relación entre las variables independientes (factores de riesgo) y las variables de efecto mediante la toma de medidas instantáneas. La población de este estudio fueron pacientes con accidente cerebrovascular con lesiones por decúbito tratados en el hospital. La técnica de muestreo en este estudio es un muestreo consecutivo basado en un propósito u objetivo específico determinado por el investigador. La muestra en el estudio fue de 16 personas. Análisis de datos univariados y bivariados con resultados de pruebas exactas de Fisher.*

Resultados: *Los resultados del estudio fueron el número de encuestados que usaban colchón antiescaras fue de 15 personas (93,8 %), mientras que los que no usaban colchón fue de una persona (6,2 %), mientras que el número de encuestados basado en integridad de la piel durante menos de siete días de tratamiento, es decir, mejoró hasta en 15 personas (93,8 %) y empeoró hasta en 1 persona (6,2 %). La prueba de análisis de la prueba exacta de Fisher obtuvo un valor de p = 0,041.*

Conclusión: *Hubo un cambio en el grado de las úlceras por presión en los pacientes con accidente cerebrovascular que utilizan colchones antiescaras en el hospital. Se espera que se realicen más investigaciones con mayor número de muestras con estudios en profundidad y control de los factores que afectan las úlceras por presión.*

Palabras clave: *Colchón antiescaras, integridad de la piel, ictus.*

INTRODUCTION

Stroke is one of the non-communicable diseases that are the most feared health problem in the community. Stroke is caused by non-traumatic cerebral blood circulation disorders. Strokes can cause death without finding other causes other than vascular causes (1-3). The incidence of hemorrhagic stroke is 17 %, and ischemic stroke is about 83 % of all stroke cases. Stroke is the number 5 cause of death in America (4,5). Indonesia has the highest ranking of stroke sufferers in Southeast Asia, so stroke is a significant and urgent problem. According to the World Health Organization (WHO), in 2018, the prevalence of pressure sores in the world was 21 % or about 8.50 million cases. In Indonesia, the incidence of pressure sores is 8.2 per 1 000 population. The incidence and prevalence of pressure sores in America are quite high and need attention from health workers. The results of research in several government hospitals in Indonesia, the incidence of pressure sores in bed rest patients is 15.8 % to 38.18 %. In comparison, the 2018 Basic Health Research is a very high figure for Indonesia at 10.9 % per population mile. The highest province is East Kalimantan province, with a 14.7 % per mile population of East Kalimantan, and the lowest in Papua province is only 4.1 % per mile population of Papua based on doctor's diagnosis. Meanwhile, South Sulawesi Province itself is not left behind with a very high figure of 10.7 % per population mile (6). The prevalence of stroke in the 2018 Rikesdas data reached 10.9 per mile. West Sumatra Province is a province that has a fairly high rate of almost 10.9 per mile. In Pariaman, the incidence of stroke has also increased. In Pariaman Hospital in 2017, there were 162 cases and in 2018 there were 193 cases. As a result of the increasing number of stroke patients in this hospital, many patients are currently lying-in care for a long time. For the period January 2019 to January 2020, there are 17 risks of pressure sores due to prolonged bed rest (7,8).

One of the effects of stroke is pressure sores which can cause damage to skin integrity. Pressure on the skin in direct contact with the bed surface will cause pressure sores. People in their daily life call it that because it is too long to lie in bed without being helped to change its position. Meanwhile, damage to skin integrity occurs due to prolonged pressure, skin irritation, or immobilization, causing pressure sores. Research results by Lailiatus et al. (2017) showed that the length of hospitalization for pressure sores in immobilized patients was 88.8 %, and decubitus ulcers appeared with an average length of stay on the fifth day of treatment (9-12).

Various intervention efforts can be made to prevent pressure sores, such as clinical practice guidelines issued by the American Health of Care Plan Resources (AHCPR), consisting of 3 categories, namely skin care and early treatment, including risk assessment of patients with pressure sores, improving the patient's

age condition, maintenance, good skin care, prevention of ulcers by lying down. The second intervention that can be done is using various boards, anti-decubitus mats, or good bedding, while the third intervention is educating patients and families (10,13-17).

In a study conducted by Manzano in 2014 under the title Comparison of Pressure Ulcer Prevention in Patients With Two Repositioning Schedules Using Mechanical Ventilation and Compressed Air Mattresses, the results showed a strategy aimed at increasing the frequency of repositioning (2 hours and 4 hours) in patients under Mechanical ventilation (MV) and on Alternating Pressure Air Mattress (APAM) did not reduce the incidence of pressure ulcers, but these interventions were able to reduce side effects of long lie down and reduce the workload of care (18). While the study results were the average length of time spent on the mattress for 31 days. At the end of the evaluation, none of the patients experienced pressure sores when using the mattress. These results indicate that these anti-decubitus mattresses are effective when using interventions to prevent pressure ulcers (18-20).

The results of observations at Pariaman Hospital conducted by researchers on 6 stroke patients who have been hospitalized for a long time have a high risk of impaired skin integrity such as pressure sores. Impaired skin integrity occurs due to prolonged pressure, skin irritation, or immobilization causing pressure sores. Therefore, to reduce the incidence or reduce pressure sores in stroke patients, one of the interventions that can be done is to apply the anti-decubitus matrix in the hospital correctly and keep repositioning the bed. So it can be concluded that pressure sores are very common in patients with long-lying cases such as stroke, so it is necessary to provide skin care intervention using an anti-decubitus mattress procedure. Therefore, researchers are interested in conducting research in hospitals on the relationship between the use of anti-decubitus mattresses and skin integrity among stroke patients.

METHODS

The research design was quantitative research. This study uses a cross-sectional design, a non-experimental type of research. It is often used for the relationship between independent variables (risk factors) and effect variables by taking instantaneous measurements. The population in this study were stroke patients with decubitus injuries treated at a hospital in Pariaman City. The sampling technique in this study is the non-probability sampling technique with consecutive sampling is a method of selecting samples based on certain goals or objectives determined by the researcher. The sample in the study was 16 people. Statistical analysis of univariate and bivariate data conducted with fisher exact test results.

RESULTS

Based on Table 1, it can be seen that the same number of respondents for the age category in this study were found at the age of 46-55 years, namely 8, as well as for those aged 56-70 years. Furthermore, this study found that the male gender was 9 respondents (56.3 %) and the female respondents were 7 (43.7 %). It can be seen that of the 16 respondents, 15 respondents used anti-decubitus mattresses (93.8 %) while 1 person did not use mattresses (6.2 %). Furthermore, it can be seen that of the 16 respondents, there were a number of respondents based on skin integrity for less than seven days of treatment; namely,

Table 1

Frequency Distribution of Respondents

Characteristics	Frequency (f)	Percentage (%)
Age		
46-55	8	50
56-70	8	50
Gender		
Man	9	56.3
Woman	7	43.7
Using an Antidecubitus Mat		
Use	15	93.8
Do Not Use	1	6.2
Skin Integrity		
Advantage	1	6.2
Disadvantage	15	93.8
Total	16	100

there was no deterioration as many as 15 people (93.8 %) while there was a deterioration of 1 person (6.2 %).

Based on Table 2, it can be seen that of the 16 respondents, 15 respondents (93,8 %) using an anti-decubitus mattress showed no significant deterioration in the skin integrity of stroke patients compared to respondents who did not use an anti-decubitus mattress, only 1 person (6.2 %) indicates that the integrity of the skin is deteriorating. Therefore, it can be concluded that there is a relationship between the use of anti-decubitus mats and skin integrity in stroke patients. Furthermore, fisher's exact test results obtained a p-value = 0.041, meaning there is a significant relationship between the use of anti-decubitus mattresses and skin integrity in stroke patients.

Table 2

Correlation between Antidecubit Mattress Use and Skin Integrity in Stroke Patients

Mattress Use Anti-Decubitus	Skin Integrity				p-value
	Advantage		Disadvantage		
	f	%	f	%	
Use	15	93.8	1	6.2	0.041
Do Not Use	1	6.2	15	93.8	
Total	16	100.0	16	100.0	

DISCUSSION

Based on results showed a significant relationship between the use of anti-decubitus mattresses and skin integrity in stroke patients. In the hospital, the handling actions that a nurse always takes to prevent skin integrity disorders, in this case, decubitus, include a small pillow as support, doing bed over every 2 hours, at night, the period is extended every 4 hours so that the patient can sleep undisturbed (19). Sleep can support anabolic processes; thus, healing wounds can be facilitated. In this study, nurses focused on using anti-decubitus mattresses used not only at this time but carried out continuously according to the patient's condition. In addition, the nurse performs bed over, but it is done in the next 4-5 hours. According to the 2018 Indonesian Nursing Intervention Standards, the therapeutic action for treating pressure sores is to use a special bed or mattress to treat the skin due to emphasis on bone prominences (21-23).

This is in line with the following discussion that pressure sore prevention is a nurse's role in providing patient services. Efforts to prevent pressure sores were done as early as possible since the patient is identified as being at risk for pressure ulcers. Prevention of pressure sores should focus more on efforts to prevent excessive and continuous pressure in addition to improving other risk factors (13,24).

In the case of stroke patients who are on bed rest, the most important thing to do is skin care to prevent pressure on the skin. Prevention of pressure on the skin that can be given is surface support, in this case, the use of a bed with the mechanical application of an anti-decubitus mattress. The purpose of the surface support provided is to reduce pressure on the skin and bone/tissue. The anti-decubitus mattress used in hospitals can be adjusted to the patient's body contour so that the pressure distributed through the surface of the anti-decubitus mattress can concentrate and contribute to a more limited area (13,19).

This study's results align with Rustina's (2017) research on the effect of using anti-decubitus mattresses on the degree of decubitus in bedrest patients. The study's results on 9 respondents showed that after being given treatment using an anti-decubitus mattress for 10 days, a significant effect was obtained on the use of anti-decubitus mattresses in bed rest patients with grades 1 and 2. So it can be assumed that the improvement of skin integrity in stroke patients (24).

Skincare is one for preventing pressure sores, where it should be focused on efforts to prevent excessive pressure and the length of treatment days. The results of this study indicate that changes in pressure on the initial day of hospitalization to the last day of hospitalization for 7 days were found in patients using an anti-decubitus mattress, while in patients who did not use an anti-decubitus mattress, the reason being that the patient did not want to use it did not have good pressure change progress. Provision of communication, information, and education

(IEC) media regarding the prevention (8). In addition, several factors can influence changes in the wound or the occurrence of pressure, namely the patient's nutritional status, age, weight, and the strict concept of changing position. In addition, it is also essential to socialize and increase knowledge and public awareness about healthy lifestyles (7,25).

CONCLUSION

Improving skin integrity in stroke patients is skin care, one of which is the prevention of pressure sores which must be focused on preventing excessive pressure and length of treatment days, as well as factors that can affect wound changes or the occurrence of burns. Prevention of pressure on the skin can be given is the use of a bed with the mechanical application of an anti-decubitus mattress. The ultimate goal is to reduce pressure on the skin and bone or tissue and improve the quality of life among patients.

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The role of C-Reactive Protein in the level severity of hyperemesis gravidarum

El papel de la Proteína C Reactiva en el nivel de gravedad de la hiperemesis gravídica

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SUMMARY

Introduction: *Causes of Hyperemesis Gravidarum (HG) are unknown. C-Reactive Protein (CRP) is thought to play an important role in the occurrence of HG. This study is to determine the values of CRP in normal pregnant women and hyperemesis gravidarum (HG), CRP levels on HG severity, and to know the role of CRP in the severity of HG.*

Methods: *The study design was cross-sectional, with 50 first-trimester pregnant women taken as samples consisting of 25 normal pregnant women and 25 mothers with HG. Blood serum samples were collected using High Sensitivity CRP (hs-CRP) for CRP content. HG severity data were used by filling out the Unique Quantification Questionnaire Emesis/ Nausea (PUQE), divided into three groups: mild HG, moderate HG, and severe HG. Data analysis was conducted using the Mann-Whitney test, Kruskal Wallis, and Post Hoc Test.*

Results: *The results showed no difference between C-Reactive Protein levels between normal pregnant women and HG. However, there were different levels of CRP values mild, moderate, and severe HG. Although there was a doubling in CRP levels between mild HG and heavy HG, CRP levels were also found to be different in moderate HG and heavy HG, with a mean difference of 7,94 mg/L.*

Conclusion: *An increase in average CRP levels was found beyond the normal limit for those with heavy HG. Elevated levels of CRP played an important role in the context of specific HGs, particularly in severe HG. Therefore, examining inflammatory markers,*

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especially CRP levels, is expected to be considered supporting data in the pathogenesis of HG.

Keywords: *CRP, hyperemesis gravidarum, inflamasi.*

RESUMEN

Introducción: *Las causas de la hiperémesis gravídica (HG) son desconocidas. Se cree que la proteína C reactiva (PCR) desempeña un papel importante en la aparición de HG. Este estudio tiene como objetivo determinar los valores de PCR en mujeres embarazadas normales e hiperémesis gravídica (HG), los niveles de PCR en la gravedad de la HG y conocer el papel de la PCR en la gravedad de la HG.*
Métodos: *El diseño del estudio fue transversal, se tomaron 50 gestantes de primer trimestre como muestra conformada por 25 gestantes normales y 25 madres con HG. Las muestras de suero sanguíneo se recolectaron, y utilizando un PCR de alta sensibilidad (hs-PCR) se determinó el contenido de PCR. Los datos de gravedad de la HG se utilizaron mediante el llenado del Cuestionario Único de Cuantificación Emesis/Náuseas (PUQE), divididos en tres grupos: HG leve, HG moderada y HG grave. El análisis de datos se realizó mediante la prueba de Mann-Whitney, Kruskal Wallis y Post Hoc Test.*
Resultados: *Los resultados no mostraron diferencias entre los niveles de proteína C reactiva entre mujeres embarazadas normales y HG. Sin embargo, hubo diferentes niveles de valores de PCR en HG leve, moderada y severa. Aunque hubo una duplicación en los niveles de PCR entre la HG leve y la HG intensa, también se encontró que los niveles de PCR eran diferentes en la HG moderada y la HG intensa, con una diferencia media de 7,94 mg/L.*
Conclusión: *Se encontró un aumento en los niveles promedio de PCR más allá del límite normal para aquellos con HG abundante. Los niveles elevados de PCR desempeñaron un papel importante en el contexto de HG específicos, particularmente en HG grave. Por lo tanto, se espera que el examen de los marcadores inflamatorios, especialmente los niveles de PCR, se considere como datos de respaldo en la patogenia de la HG.*

Palabras clave: *PCR, hiperémesis gravídica, inflamación.*

INTRODUCTION

Nausea and vomiting in pregnancy can occur in 2/3 of pregnant women worldwide. The severe form of nausea and vomiting in pregnancy is hyperemesis gravidarum (HG). Hyperemesis gravidarum can occur in 0.3 %-3.6 % of pregnant women (1). HG, which is severe nausea and vomiting, can cause dehydration, acid-base, electrolyte disorders, ketosis (2,3), and cancer with long-term effects associated with increased Human Chorionic Gonadotropin (HCG) hormone (4-6). In addition, HG can also cause low birth weight (7), small pregnancies and preterm births (8-10), and nerve development delays in children born (11-13).

The cause of HG is not known for sure, but the system of immune dysregulation is thought to be one of the factors that play a role in the occurrence of HG (11). Where are inflammatory markers cytokines such as TNF-α, interleukin-6 (IL-6) (14), C-reactive protein (CRP) (15), neutrophil-to-lymphocyte ratio (NLR), and platelet-to-lymphocyte ratio (PLR) (16,17) and white blood cells it is known that it tends to increase in mothers with HG (15).

C-Reactive Protein (CRP), a marker of acute phase inflammation, has been found to increase the incidence of HG (15,18,19). But not all studies agree on the role of CRP in the incidence of HG, where the results of the study by Tunc et al. (20) and Akdag et al. (21) found no significant association between CRP levels and HG incidence.

There is still controversy over the use of CRP levels in maternal blood that can indicate the role of inflammation as one of the triggers of HG. In addition, the role of CRP levels in pregnant women with HG and the severity of HG is not yet known. For this reason, the researchers were interested to assess the role of CRP in the severity of HG.

METHODS

Design Study

This research was conducted in the obstetric care room and midwifery polyclinic at three hospitals dan two health centers. This study is a form of observational study using a cross-sectional study design.

Population and Sample

The population in this study were 25 pregnant women who were treated or treated by road due to experiencing HG based on medical record diagnoses and 25 normal pregnant women based on medical record diagnoses that examined their health in the polyclinic. Selected by stratified sampling, which met the criteria for inclusion criteria, namely first-trimester pregnant women willing to become respondents by signing an informed consent issued by the Ethics Committee of the Faculty of Medicine, Universitas Hasanuddin with number UH1702121105, and exclusion criteria, namely twin pregnancies, maternal pregnancy, suffering from urinary tract infections, suffering from gastrointestinal and thyroid disease, and suffering from diabetes mellitus.

Method of Collecting Data

Data collection in this study was conducted in two ways: examining CRP levels and measuring the severity of HG experienced by respondents. Examining CRP levels was carried out by taking blood samples through the median acuity vein as much as 5 mL, then centrifuging for 10 minutes at a speed of 3 000 rpm to separate the serum. The separated serum was taken as much as 0.1 mL for examination using ELISA High Sensitivity C-Reactive Protein (hs-CRP) (Diagnostics Biochem Canada Inc. CAN-CRP-4360, Version 5.0). In addition, data on the severity of hyperemesis gravidarum were measured by filling out the Pregnancy Unique Quantification of Emesis/Nausea (PUQE) questionnaire (22). The interpretation of the results of the score calculation is between 4-15 points for HG patients, which are then grouped into three groups, namely mild HG (≤6) (n=2), moderate HG (7-12) (n=12), severe HG (13-15) (n=11).

Data Analysis

Data were processed using SPSS for Windows version 16. To find out the difference in CRP levels in normal pregnant women and pregnant women, HG was used in the "Mann-Whitney" bivariate analysis. To find out the difference in CRP levels in the HG group based on the severity of HG, the bivariate analysis "Kruskal Wallis" was used, which then carried out the Mann Whitney Post Hoc test to determine the difference in CRP levels between groups of the severity of HG.

RESULTS

Table 1 shows that the mean CRP level of blood in normal pregnant women (10.13 mg/L) does not differ greatly from the mean blood CRP in pregnant women with HG (10.34 mg/L), where the average difference between the two groups is 0.21 mg/L. To determine whether there is a difference in CRP levels between normal pregnant women and pregnant women with HG, then the analysis is carried out using the Mann-Whitney test with a level of confidence (α=0.05), obtained p-value=0.438 then statistically known there was no significant difference between CRP levels in normal pregnant women and pregnant women with HG.

Table 1

Differences in C Levels of Reactive Protein in Normal Pregnant Women and Hyperemesis Pregnant Women

Lab Results	Group of Pregnant Women		p-value
	Normal	Hyperemesis Gravidarum	
	$\bar{x}$ ± SD	$\bar{x}$ ± SD	
CRP Level	10.13 ± 9.71	10.34 ± 6.34	0.438

Normality Test: data is abnormally distributed (p<0.005) * Mann Whitney; n=50 people (normal n=25 and HG n=25); CRP examination of blood serum samples was carried out using ELISA High Sensitivity C-Reactive Protein (hs-CRP) (Diagnostics Biochem Canada Inc. CAN-CRP-4360, Version 5.0) with unit yields of mg/L. Grouping of pregnant women based on the respondent's diagnosis in the medical record.

Data analysis based on Table 2 shows that the mean CRP level in heavy HG (14.95) is greater than the mean Medium CRP (6.60) and mild (7.40). From the results of the Kruskal Wallis test, p-value=0.014, which means that there is a difference between mild, moderate, and severe CRP levels in HG.

Table 2

Comparison of CRP Levels in the Hyperemesis Gravidarum Group Based on the Level of Hyperemesis Gravidarum

Lab Result	Status Of Hyperemesis Gravidarum			p-value
	Mild $\bar{x} \pm$ SD	Moderate $\bar{x} \pm$ SD	Severe $\bar{x} \pm$ SD	
CRP Level	7.40 ± 0.20	6.60 ± 3.64	14.95 ± 6.31	0.014

Normality Test: data is abnormally distributed (p<0.005); * Kruskal Wallis Test; n=25 (HG ring n=2; HG is n=12; HG weight n=11); CRP examination of serum blood samples was initiated by using High Sensitivity C-Reactive Protein (HS-CRP) ELISA (Diagnostics Biochem Canada Inc. CAN-CRP-4360, Version 5.0) with a unit of the yield of mg/L. HG status was assessed based on the PUQE score questionnaire (mild ≤ 6, moderate 7-12, severe 13-15)

The statistical test results in Table 3 show that the mean CRP levels in mild HG pregnant women did not differ significantly from the CRP levels of the group of moderate HG pregnant women, with a mean difference of 0.8 mg/L and p-value=0.144 which means there is no difference between CRP levels in mild and moderate HG pregnant women. The difference in CRP levels in the group of pregnant women with mild HG compared with the group of heavy HG pregnant women was also known not to have a significant difference (p-value=0.167), but when viewed from the average number of heavy CRP HG levels (14.95 mg/ L), there were two greater than the CRP level in women with mild HG (7.40 mg/ L), with a difference of 7.55 mg/ L. While the difference in CRP levels in moderate and severe HG severity is known to mean CRP levels in moderate HG (6.60 mg/L), where 7.94 mg/L is smaller than the average CRP level in pregnant women with severe HG (14.95 mg/L), besides that from the analysis of the data it was found that there were significant differences between CRP levels in pregnant women with moderate and severe HG (p-value=0.007).

Table 3

Mean Differences in CRP Levels in the Hyperemesis Gravidarum Group Based on the Level of Hyperemesis Gravidarum

Lab Result	Status of Hyperemesis Gravidarum					
	Mild vs Moderate		Mild vs Severe		Moderate vs Severe	
	Mean Different	p-value	Mean Different	p-value	Mean Different	p-value
CRP Level	0.8	0.144	7.55	0.167	8.35	0.007

Mann Whitney Post Hoc Test; n = 25 (HG ring n = 2; HG is n = 12; HG weight n = 11); CRP examination of serum blood samples was initiated by using High Sensitivity C-Reactive Protein (HS-CRP) ELISA (Diagnostics Biochem Canada Inc. CAN-CRP-4360, Version 5.0) with a unit of the yield of mg/L. HG status was assessed based on the PUQE score questionnaire (mild ≤ 6, moderate 7-12, severe 13-15).

DISCUSSION

CRP is a marker of acute phase inflammation synthesized by the liver (23), which is known to play a role in the occurrence of HG (15). The role of CRP levels in the occurrence of HG is also indicated by the results of the previous study (18), which found higher CRP levels in HG compared to normal pregnant women (1.95 vs 0.56). Furthermore, these findings are reinforced by the study by Kurt et al. (19), who also found an increase in CRP levels (1.39-1.9 mg/L) in mothers with HG compared to the control group.

However, in this study, there was no significant difference in CRP levels in normal pregnant women and pregnant women with HG (p>0.438), with mean differences not much different (10.13 vs 10.34 mg/ L). These findings align with the research conducted by Tunc et al (13), which found that CRP levels were not much different

between mothers who had HG and normal pregnant women with a mean ratio of 0.184-0.384 mg/L. In addition, research conducted by Akdag et al. (21) on 30 respondents with HG and 30 normal respondents who had the same characteristics also found that CRP levels in normal pregnant women were not much different from those of HG pregnant women (0.29 vs 0.47 mg/L) and found no difference between CRP levels in the study group and the control group.

In pregnancy, it is known that increased levels of the hormone estrogen cause excessive antibody production. The hormone estrogen is a hormone that increases in number during pregnancy triggered by the presence of the placenta (23,24). According to the researchers' assumption that there is no difference in CRP levels in normal pregnant women and HG mothers in this study, it is influenced by the hormone estrogen level, which also increases in pregnancy. Judging from the average CRP levels in normal pregnant women and HG mothers who are not much different, it can be assumed that the synthesis of CRP levels in normal pregnancies and HG is equally increased due to an increase in the hormone estrogen in pregnancy. Increasing the production of CRP levels in someone other than influenced by the hormone estrogen is also influenced by many other things such as the presence of chronic infections, the presence of metabolic syndrome suffered by respondents, pharmacological treatment, physical activity, and dietary patterns carried out by respondents (25,26).

In addition, there was no difference in CRP levels in the incidence of HG in this study, possibly due to a multifactorial influence on the occurrence of HG (27). One of the factors proposed as a cause of HG is endocrine factors. Endocrinology changes (specifically estrogen and progesterone, and HCG hormones) are known to play a role in the incidence of HG (27,28). The results of the research conducted by Biberoglu et al. (29) found that hormonal imbalances in pregnancy resulted in abnormalities, including the incidence of HG. In this study, no monitoring of estrogen, progesterone, and HCG levels was carried out, so there was no known difference in hormonal levels between normal pregnant women and women with HG in the study respondents.

The concentration of CRP levels in the blood in normal women is <10 mg/L (30). In this study, there was a tendency to increase the average CRP level of blood in both normal pregnant women and pregnant women with HG. More than normal increases in CRP levels in normal pregnant women (10.13 mg/L) and pregnant women with HG (10.34 mg/L) indicate that both normal pregnant women and pregnant women with hyperemesis gravidarum experience the process of occurring inflammation.

The high CRP levels found by researchers both in normal pregnant women and pregnant women HG can be caused by the integration of the immune and endocrine systems. Increased levels of estrogen in pregnancy can stimulate excessive antibody production, causing the risk of autoimmune occurrence (23). An increase in the immune system in pregnancy is known to protect the fetus and decidua from impaired maternal immune systems (28).

Analysis of CRP levels in the severity of HG found a difference between the severity of mild, moderate, and severe HG. When viewed from the difference in CRP levels between the severity of mild and severe HG, it was seen that the average CRP level in mild HG was two times lower than the CRP level in severe HG. In addition, differences in CRP levels were also found in moderate and severe HG ($p = 0.007$) with a mean difference of 8.35 mg/ L. This finding shows that the difference in CRP levels in each pregnant woman will affect the severity of hyperemesis gravidarum experienced by the pregnant woman.

Monitoring CRP levels can be used to assess an initial inflammation and can also be used to monitor the activity of an illness (31). Elevated levels of inflammatory markers such as CRP can stimulate histamine, serotonin, dopamine, and cholinergic receptors, which are Neuroanatomical (Area Postrema for CTZ). The response from CRP stimulation then provides feedback to the gastrointestinal tract through the vagus efferent to stimulate the gastrointestinal tract to produce histamine, serotonin, dopamine, and cholinergic, causing vomiting (32).

Although there was an increase in CRP levels, the increase did not increase in balance from mild HG to severe HG. This differs from the results of research conducted by Kurt et al. (19), who found an increase in CRP levels in proportion

to the severity of HG. This may be due to the imbalance in the number of respondents in each group of HG severity in this study and the difference in the use of CRP levels associated with the sensitivity of the device in detecting CRP levels in the blood.

This study also found CRP levels that exceeded normal values in the incidence of severe HG (14.03 mg/L> 10.00 mg/L), which means that an inflammatory process occurs in severe HG. An increase in CRP levels in the incidence of HG seems to play a role in the occurrence of severe hyperemesis gravidarum. It is associated with inflammation, one of the causes of vomiting, by causing stimulation to center vomiting (33). Immune system enhancement is also known to cause a decrease in gastric totality, leading to *Helicobacter pylori* development (34). The presence of Helicobacter pylori is known to worsen the incidence of HG (34) and is associated with the pathogenesis of HG events (35).

In addition, Schwedler et al. (36) found a close relationship between an increase in CRP levels and oxidative stress due to the increasing production of reactive oxygen species (ROS). Oxidative stress in the incidence of HG was found to increase oxidant levels (37). Another study found that oxidative stress stimulates the synthesis of various trophoblastic proteins, such as HCG and estrogen (38). This causes an increase in HCG and estrogen levels in the incidence of HG, which will further aggravate the incidence of HG experienced by a pregnant woman.

CONCLUSION

Based on the research results, it appears that the levels of C-reactive protein are not different between normal pregnant women and pregnant women with HG. But CRP levels differed in the severity of mild, moderate, and severe HG. Specific differences were found in moderate and severe HG, and CRP levels doubled between mild and severe HG. In addition, heavy HG found an increase in CRP levels that exceeded the normal limit. It seems that an increase in CRP levels plays an essential role in the occurrence of HG, especially in severe HG. Inflammatory markers, especially CRP levels, can be used as supporting data in the pathogenesis of HG.

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The effect of progressive muscle relaxation therapy on anxiety of hemodialysis patients in Pekanbaru, Indonesia

El efecto de la terapia de relajación muscular progresiva sobre la ansiedad de los pacientes de hemodiálisis en Pekanbaru, Indonesia

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SUMMARY

Introduction: *Hemodialysis is a renal replacement therapy used by patients with chronic kidney failure. Psychological problems that hemodialysis patients often experience are anxiety. Anxiety among hemodialysis patients can be overcome by relaxation, one of which is progressive muscle relaxation. This study aimed to determine the effect of progressive muscle relaxation therapy on the anxiety level of hemodialysis patients.*
Methods: *This research is quantitative research with a pre-experimental design. The sampling technique uses total sampling with a number of respondents of 20 people. Collecting data used the Hamilton Anxiety Rating Scale (HARS) questionnaire sheet and paired samples Students T-test.*
Results: *The results of the study before the intervention showed that respondents with mild anxiety were 11 people (55 %), moderate anxiety was 5 (25 %), heavy anxiety was 1 person (5 %), and 3 people were not anxious (15 %). After the intervention, the respondent's anxiety levels became less anxious 7 people (35 %), 12 people with mild anxiety (60 %), and 1 person with moderate anxiety (5 %). Based on the results, it was obtained that p-value = 0.0001 was smaller than alpha ($p < 0.05$).*
Conclusion: *There is a significant difference between the anxiety levels of hemodialysis patients before and after being given progressive muscle relaxation therapy. It is recommended that progressive muscle relaxation can be used to reduce anxiety in hemodialysis patients.*

Keywords: *Anxiety, hemodialysis, progressive muscle relaxation therapy.*

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RESUMEN

Introducción: *La hemodiálisis es una terapia de reemplazo renal utilizada por pacientes con insuficiencia renal crónica. Los problemas psicológicos que a menudo experimentan los pacientes de hemodiálisis son la ansiedad. La ansiedad entre los pacientes de hemodiálisis puede superarse mediante la relajación, una de las cuales es la relajación muscular progresiva. Este estudio tuvo como objetivo determinar el efecto de la terapia de relajación muscular progresiva en el nivel de ansiedad de los pacientes en hemodiálisis.*

Métodos: *Esta investigación es una investigación cuantitativa con un diseño preexperimental. La técnica de muestreo utiliza un muestreo total con un número de encuestados de 20 personas. La recopilación de datos utilizó la hoja de cuestionario de la escala de calificación de ansiedad de Hamilton (HARS) y la prueba T de Student de muestras pareadas.*
Resultados: *Los resultados del estudio antes de la intervención mostraron que los encuestados con ansiedad leve fueron 11 personas (55 %), la ansiedad moderada fue 5 (25 %), la ansiedad severa fue 1 persona (5 %) y 3 personas no estaban ansiosas (15 %). Después de la intervención, los niveles de ansiedad del encuestado se volvieron menos ansiosos 7 personas (35 %), 12 personas con ansiedad leve (60 %) y 1 persona con ansiedad moderada (5 %). Con base en los resultados, se obtuvo que el valor p = 0,0001 fue menor que alfa (p < 0,05).*
Conclusión: *Existe una diferencia significativa entre los niveles de ansiedad de los pacientes en hemodiálisis antes y después de recibir terapia de relajación muscular progresiva. Se recomienda que la relajación muscular progresiva se pueda utilizar como una forma de reducir la ansiedad en pacientes en hemodiálisis.*

Palabras clave: *Ansiedad, hemodiálisis, terapia de relajación muscular progresiva.*

INTRODUCTION

Chronic kidney failure is a functional disorder in the kidneys, namely in regulating fluid and electrolyte balance and loss of power in the metabolic process (1). This condition can cause uremia or excess urea in the blood due to the accumulation of substances that cannot be removed from the body by the kidneys which leads to kidney tissue damage progressive and reversible (2-4). In the worst case, the patient could be in danger of his life if he did not regularly undergo hemodialysis (dialysis) or a kidney transplant to replace his kidney, which had been badly damaged (5). In Indonesia, a kidney disease that is quite often encountered, among others, is kidney failure. Defined as chronic kidney failure if a doctor has been diagnosed with chronic kidney failure (at least sick for three months in a row) (6-8).

According to the World Health Organization (WHO) and according to the Global Burden of Disease (GBD) study in 2015, 1.2 million people died from kidney failure, increasing 32 % since 2005. The prevalence of chronic kidney disease sufferers reaches 30 million people or 15 % of the adult population, and 96 % of the population is unaware that there has been mild renal impairment (9). The situation of chronic kidney disease in Indonesia reached 0.2 % (499,800) people in 2013 (6). In 2018, the proportion of people with chronic kidney disease who had or was undergoing hemodialysis increased to 19.3 % (10). According to Indonesia Renal Registry (IRR) in 2018, new patients in Riau in 2017 amounted to 40 people and increased in 2018 to 1097 people (11). The number of hemodialysis patients in 2018 was 132 142 (499 per million population) and 66,433 new patients (251 per million population). The number of hemodialysis patients at the Arifin Achmad Hospital, Riau Province, in 2020 amounted to 47 people (12).

Patients undergoing hemodialysis therapy think that to survive, they must depend on a dialysis machine which causes them to feel threatened, and it will not take long so that high feelings of anxiety and conflicts in the family will arise (13-16). This theory is supported by the research conducted in Manado that of 40 chronic kidney failure patients who underwent dialysis therapy, 100 % experienced anxiety (17). Anxiety that is not treated immediately will trigger the emergence of negative emotions that impact the quality of life of hemodialysis patients (18).

There are several ways to deal with anxiety in hemodialysis patients, one of which is progressive muscle relaxation therapy. Progressive Muscle Relaxation Therapy can reduce anxiety. This is supported by research by Alfiyanti, Setyawan, and Kusuma (2014) conducted at a hospital from 13 respondents who experienced mild anxiety, it decreased to 10 respondents, then 4 respondents with moderate anxiety and 1 respondent with severe anxiety after being given the intervention no longer experienced anxiety (19). However, based on a preliminary survey in January 2021 showed that 70 % of patients experienced anxiety. Meanwhile, the results of interviews with room nurses said that almost all patients experienced anxiety. Therefore, this study aimed to determine the effect of progressive muscle relaxation therapy on anxiety levels in hemodialysis patients at the hospital.

METHODS

This research is a quantitative study with a pre-experimental design in the form of a one-group pre-post-test design without a control group. This design has been observed through a pretest first, then given treatment or intervention, and then a posttest to find out the changes that occur before and after being given treatment or intervention (20). The intervention that will be given in this study is progressive muscle relaxation therapy which consists of 15 movements and is given to hemodialysis patients. Sampling in this study used a total sampling amount of 20 patients. Data collection using the Hamilton Anxiety Rating Scale (HARS) questionnaire sheet consists of two types: demographic questions consisting of initials, gender, age, and education and an anxiety level questionnaire consisting of 13 questions about anxiety symptoms and 1 category of behaviour during interviews.

Analysis of the data in this study using the Statistical test paired samples t-test. This research has conducted an ethical test at the Sekolah Tinggi Ilmu Kesehatan Hang Tuah, Pekanbaru with an ethical test number: 240/KEPK/STIKes-HTP/V/2021.

RESULTS

Table 1 showed that most of the respondents were female (55 %), early elderly category (55 %), and graduated from high school education (40 %)

Based on Table 2, it can be seen that the anxiety level of respondents before being given progressive muscle relaxation therapy, most of the respondents experienced mild anxiety as many 11 people (55 %). However, after being given progressive muscle relaxation therapy, there was a decrease in the respondent's anxiety levels from heavy anxiety from one person (5 %) to 0 people (0 %), moderate anxiety from 5 people (25 %) to 1 person (5 %), mild anxiety level increased from 11 people (55 %) to 12 people (60 %). The non-anxiety category increased from 3 people (15 %) to 7 people (35 %).

Table 1

Characteristics of Respondents

Characteristics	Frequency	Percent (%)
Gender		
Male	9	45
Female	11	55
Age (Years)		
Early Adulthood (26-35)	1	5
Late Adulthood (36-45)	3	15
Early Elderly (46-55)	11	55
Late Elderly (56-65)	3	15
Seniors (>65)	2	10
Level of Education		
Elementary School	3	15
Junior High School	4	20
Senior High School	8	40
Bachelor's degree	4	20
Master's degree	1	5
Total	20	100

Table 2

Distribution of Anxiety Levels in Hemodialysis Patients Before and After Progressive Muscle Relaxation Therapy

Anxiety Level	Pretest		Post-Test	
	n	%	n	%
No Anxiety	3	15	7	35
Mild Anxiety	11	55	12	60
Moderate Anxiety	5	25	1	5
Heavy Anxiety	1	5	0	0
Very anxious	0	0	0	0
Total	20	100	20	100

Based on Table 3 on the statistical test using paired samples t-test shows the results of the value of p-value = 0.0001. There is an effect of progressive muscle relaxation technique on anxiety-level hemodialysis patients in hospitals.

Table 3

Analysis of the Effect of Progressive Muscle Relaxation Therapy on Anxiety Levels in Patients Undergoing Hemodialysis

Anxiety Levels	Mean	SD	p-value
Pretest	16.45	6.992	0.0001
Post-test	12.20	5.297	

DISCUSSION

The results show that most respondents are in the early elderly category (46-55). This is in line with a previous study that kidney function will begin to decline when a person is over 40 years old. If he reaches the age of 90, the remaining kidney function may only be 50 % (21). Changes in kidney function along with the aging process increase the susceptibility of the elderly to impaired function and kidney failure. Changes in renal blood flow, glomerular filtration, and kidney hygiene in kidney failure increase the risk of treatment-related changes. In the elderly, many kidney hemostatic functions are reduced, so it is a predisposition to cause kidney failure (22). This study is also in line with research that the age group 45 years is the most affected by chronic kidney failure, as much as 73.96 %, and the age group 44, as much as 26.04 % (23).

Most education levels of hemodialysis patients are in senior high school. This is in line with research that the highest level of education is at the high school level (24). This is influenced because everyone needs the knowledge to improve their quality of life. For this reason, to increase their knowledge, higher education is needed. Education is not only formal but can be obtained informally (25). According to Mubarak et al. (2015), someone with knowledge and intellectual abilities will be able to increase his ability and self-confidence in dealing with stress. The higher the education a person has, the easier and more able to deal with existing stress (26). Education and health are two related things, namely, education is a means used by individuals to understand the importance of health and how to maintain a healthy lifestyle.

Researchers proved that after being given a progressive muscle relaxation technique, there was a change in the level of anxiety in hemodialysis patients. The progressive muscle relaxation techniques are relaxed that can normalize the functions of the body's organs. The feeling of relaxation that is felt will be transmitted to the hypothalamus to stimulate the pituitary gland to increase endorphins, enkephalins, and serotonin, the increase in these hormones occurs due to the influence of Corticotropic Releasing Factor (CRF) released by the hypothalamus, which will stimulate the pituitary gland (27). Increasing the production of endorphins, enkephalins, and serotonin will cause feelings of calm and relaxation (28). This hormone can function as a natural sedative produced in the brain and spinal cord. This follows the theory that progressive muscle relaxation techniques can reduce anxiety levels in a person because progressive muscle relaxation techniques have a relaxing effect on the body (27). The use of progressive muscle relaxation techniques can be applied because it is easy to do. This relaxation only involves the muscle system without the help of other tools. Progressive muscle relaxation techniques can be done in a resting state, namely when sitting relaxed, or watching TV, before going to bed, so it is easy to do anytime.

According to the theory by Edmund Jacobson, progressive muscle relaxation is done by focusing on a muscle activity by identifying the muscle tension by performing several relaxation actions to create a relaxed feeling. In other words, this relaxation technique is a technique that combines breathing exercises with muscle tension and muscle relaxation (29). The results of this study align with research by Saputri et al., in 2016 about the effect of progressive muscle relaxation on the anxiety levels of mothers in the third trimester at the public health center after being given the intervention of progressive muscle relaxation (30). The progressive muscle relaxation technique focuses on muscle activity by identifying tense muscles and then reducing tension by doing relaxation techniques to get a relaxed feeling so that after relaxing, these muscles can reduce tension muscles, reduce headaches, and insomnia and can be done to reduce anxiety levels (31).

CONCLUSION

In conclusion, it was found that there was a significant difference between the level of anxiety before and after being given progressive muscle relaxation techniques to the anxiety level of hemodialysis patients in the hospital. Therefore, progressive muscle relaxation therapy can be used to reduce patient anxiety, especially in the hemodialysis room.

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Learning experience about human anatomy of health students during the pandemic COVID-19: A phenomenological study

Experiencia de aprendizaje sobre anatomía humana de estudiantes de salud durante la pandemia de COVID-19: un estudio de fenomenología

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SUMMARY

Introduction: *During COVID-19, health students should learn human anatomy online. By learning online, students have difficulty understanding the subject material. This study aims to explore the experiences of health students learning the anatomy of the human body during the COVID-19 pandemic.*
Methods: *This study used a qualitative study with a phenomenological study approach. This study's participants were seven health students from two private universities in Pekanbaru city, which were taken by purposive sampling. Data collection used in-depth interviews and was analyzed using the phenomenological method developed by Colaizzi.*
Results: *Researchers found five main themes, namely the learning process during the COVID-19 pandemic, obstacles to the online learning process, obstacles for students to learn the anatomy of the human body during the COVID-19 pandemic, student efforts to find references, and expectations of students learning anatomy during the COVID-19 pandemic.*
Conclusion: *Students experience several obstacles during participating in online learning while the pandemic occurs, especially in understanding the anatomy of the human body. Students make several efforts to add learning resources and hope there will be digital learning applications with animation and image features and detailed explanations of human anatomy. This study recommends that educational institutions use digital applications to support learning to make it easier for students to understand the anatomy of the human body.*

Keywords: *Anatomy of the human body, applications, digital, learning, online, student experience.*

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RESUMEN

Introducción: *Durante el COVID-19, los estudiantes de salud aprendieron anatomía humana en línea. Al aprender en línea, los estudiantes tienen dificultades para comprender el material de la asignatura. Este estudio tiene como objetivo explorar las experiencias de los estudiantes de salud que aprendieron la anatomía*

del cuerpo humano durante la pandemia de COVID-19.
Métodos: *Este estudio utilizó un estudio cualitativo con un enfoque de estudio fenomenológico. Los participantes de este estudio fueron siete estudiantes de salud de dos universidades privadas de la ciudad de Pekanbaru, que fueron tomados por muestreo intencional. La recolección de datos utilizó entrevistas en profundidad y fue analizada utilizando el método fenomenológico desarrollado por Colaizzi.*
Resultados: *Los investigadores encontraron cinco temas principales, a saber, el proceso de aprendizaje durante la pandemia de COVID-19, los obstáculos para el proceso de aprendizaje en línea, los obstáculos para que los estudiantes aprendan la anatomía del cuerpo humano durante la pandemia de COVID-19, los esfuerzos de los estudiantes para encontrar referencias, y expectativas de los estudiantes que aprenden anatomía durante la pandemia de COVID-19.*
Conclusión: *Los estudiantes experimentaron varios obstáculos durante la participación en el aprendizaje en línea mientras ocurrió la pandemia, especialmente en la comprensión de la anatomía del cuerpo humano. Los estudiantes hicieron varios esfuerzos para agregar recursos de aprendizaje y esperaron que haya aplicaciones de aprendizaje digital con características de animación e imagen y explicaciones detalladas de la anatomía humana. Este estudio recomienda que las instituciones educativas utilicen aplicaciones digitales para apoyar el aprendizaje y facilitar a los estudiantes la comprensión de la anatomía del cuerpo humano.*

Palabras clave: *Anatomía del cuerpo humano, aplicaciones, digital, aprendizaje, en línea, experiencia estudiantil.*

INTRODUCTION

The World Health Organization (WHO) determined the occurrence of a pandemic caused by the Novel Coronavirus Disease 2019 (COVID-19) on March 11, 2020 (1). Deaths due to this virus in Indonesia have been increasing since mid-2020. Indonesian President, Jokowi, issued a policy on implementing Large-Scale Social Restrictions (PSBB) (2-5). The enactment of PSBB impacts the learning process at all levels of education. The Decree of the Ministry of Education and Culture of the Republic of Indonesia in 2020 requires that all educational institutions carry out online or online-based learning processes (6).

Online-based learning is students' use of the internet in learning activities. Student participation in online-based learning activities is essential to developing instructional skills and knowledge of the relevant learning content (7,8). Students' perceptions of online learning provide convenience in accessing lecture materials and motivation (9-11). Besides that, it helped to understand the material for learning individually and in groups and support active learning (12).

Online learning media is a medium that is of interest to students. It can increase interaction in the learning process and easily access and communicate with classmates and teachers (13). Even so, students prefer face-to-face learning (offline) in class. Students revealed that online learning needs to buy internet quota frequently to stay online. These results showed that the need is increasing. It will make it difficult for students from remote areas to get a stable internet network (14,15).

Anatomy courses explain the human body's structure, including joints, muscles, bones, organs, and nerves. Anatomy is a basic science in medicine. Anatomy makes a doctor able to understand the patient's disease condition well. Besides that, anatomy is also needed as a basis by nurses, midwives, dentists, physiotherapists, and all health-related professions (16). Learning anatomy requires students to understand theories, concepts, and facts and conduct a discovery process. In general, the activity of finding concepts can be implemented through practical activities. Practicum is one of the learning strategies that can attract students' interest in developing science concepts because practicum can provide knowledge and experience directly to students to observe a phenomenon that occurs. Hence, students will better understand the concepts being taught (14,17).

The biggest problem students face in practicum is the lack of understanding of the practicum process because they are not directly involved in the practice. The advantage is that the time and place of the practicum are more flexible because it can be performed anytime and anywhere (18). Based on the previous results, practical learning activities during the COVID-19 pandemic were mostly carried out in various universities (19,20). Therefore, the form of experimental practicum with simple tools and materials is most often applied and sought after by most students. Some practicums are still being carried out offline by

considering strict health protocols. The form of the lecturer's explanation regarding the practicum procedure that is regarded as optimal is the use of the form of a module book or practicum manual accompanied by a detailed description. This study aimed to explore in-depth information about the experiences of health students studying the anatomy of the human body during the COVID-19 pandemic.

METHODS

This study used a qualitative phenomenological design. The participants were seven health students studying the human body's anatomy at two private health universities in Pekanbaru city. Then, the study variables were students learning the anatomy of the human body during the COVID-19 pandemic, sex, and age. Each variable was asked using a checklist format and interview guide. Data collection used in-depth interviews with informants, field notes, and a voice recorder. However, data analysis used the Colaizzi method. Data validation used the data triangulation method. This research has passed the health research ethics test at Health Research Ethics Committee Sekolah Tinggi Ilmu Kesehatan Hang Tuah Pekanbaru with the letter number: 111/KEPK/STIKes-HTP/II/2022.

RESULTS

From the results of the study, there were five research themes, which are: the learning process during the COVID-19 pandemic, obstacles to the online learning process, obstacles to learning the anatomy of the human body, efforts to add references to the anatomy of the human body, and hopes for an application to learn the anatomy of the human body.

The learning process during the COVID-19 pandemic

The learning process during the COVID-19 pandemic was viewed by student explanations regarding the media and learning methods used. In addition, excerpts from participant statements can be seen in the description below:

"...that were full courses online learning by Zoom, it's difficult. ...it is admitted that we should have... every semester there is a practicum. Still, because at that time online was very constrained.... ..for example, in the first semester, the lessons were basics, physiology, chemistry, biology, and Anatomy, and it was hard to understand it, it is hard to learn online at that time." (P2)

Obstacles to The Online Learning Process

Constraints in the online learning process experienced by participants in this study were caused by internet signal interference. According to the participants' answers below:

"...the only thing that makes it not smooth is sometimes the network or package (internet) costs." (P1)

Obstacles in Learning the Anatomy of The Human Body

The obstacles in learning the human body anatomy experienced by the participants in this study were the difficulty in understanding the material and the absence of practicum. It is evidenced by the following excerpts from the participants' answers:

"There are many problems because the names of the body parts are a bit difficult to memorize, it's like there are many different parts from top to bottom, so it's like remembering all the names of the parts contained. In anatomy, it is a bit lacking bang. ...because there's also a lot of anatomies that must be explained, especially from top to bottom, it's one point... one point, but there are so many derivatives, there are more points at the bottom, so it's like eh to understand one. Still, you have to understand everything, so it's like ...that's the problem with memorizing the names or the important parts" (P5).

Efforts to add references to human anatomy

Students' efforts to add references to the anatomy of the human body during the

COVID-19 pandemic are by looking for books in the library or looking for materials on the internet. Following are the following snippets of participants' answers:

"...Then there is also this lecturer who usually sends radiology textbooks which is in general, the name is Merrill's and Bone Ranger's books, that's the big radiology book. ...more so diligently looking at old notes, looking at old study materials" (P2)

"...sometimes go to Google, look for journals about anatomy" (P3)

Expectations for the creation of an application to learn the anatomy of the human body

The expectations for the creation of this application to learn the anatomy of the human body are illustrated by the following participant answers:

"...In the application, I want it to be complete, so it includes the position of the object of the human body. Everything is clear in it. ...perhaps a special feature can be made which can display the human body part in detail down to the smallest bones or organs. ...the human bones, the organs of the body, all of them should be detailed in pictures or videos, that's also good, so later the student can move it on their touch screen, right?" (P2)

DISCUSSION

Participants stated that participants who experienced the lecture method were replaced by the previous face-to-face (offline) now carried out remotely or from their respective homes (online) used by each campus, namely the online method. This is in line with the Ministry of Education and Culture, which stated that all types of learning are required to apply the online system (6).

Most of the participants revealed that the learning media that is often used online is Zoom meetings. Learning media using Zoom provides benefits such as this media being an alternative liaison between lecturers and students. Zoom is also one of the learning media that can be used for free and is one of the learning media that can continue lectures while educators are COVID-19. This is in line with Sidpra et al. (2020) (18), who indicated that Zoom and Google Meet are learning media that most educational institutions use as video conferencing technology, where the meeting participants are in different locations and can interact with each other digitally when carrying out online learning (21). This result is in line with the opinion stated that the use of technology is undeniable in learning during the COVID-19 pandemic. The platform that is widely used is Google Meet (20,22).

In addition, most of the participants revealed that when learning online, they experienced problems, namely the instability of the internet network. The problem is due to the quality of the provider or the power outage, especially for those who use Wi-Fi. The network will be lost due to a blackout. Another thing that happens to students during the online learning process is that the voice of the lecturer is too small, or the voice is intermittent, resulting from instability in the network. This will be a negative impact when the material from the lecturer is not channelled smoothly to students and results in communication or ineffectiveness in digesting the learning material. Therefore, during the learning process, the network becomes an important thing to fix because the network is the main link between lecturers and students as a substitute for direct class meetings. If the network is not stable, it will cause an unfavourable situation during the lecture process. Research by Hutauruk and Sidabutar in 2020 stated that the basic obstacle for students is the internet network problem (21). In urban areas, many internet service providers with adequate internet network capabilities support the online learning process. However, in rural areas, there are very few choices of internet service providers. From what is available, it turns out that the internet network quality is inadequate, so it does not support online learning.

The availability of an internet quota in supporting online learning certainly impacts the availability of funds, thus requiring students to spend more funds for the quota. This is in line with Ningsih's research (2020) which states that online learning results in increased spending and will make it difficult for students from several areas that are difficult to get a stable internet network (12).

Furthermore, the researchers found that participants experienced problems when studying the anatomy of the human body. Students had difficulty understanding and digesting the material because the anatomy of the human body has detailed theoretical properties and many memorizations and medical or foreign languages that are less familiar and known. Participants generally find it difficult to remember and memorize these body parts, especially during the COVID-19 pandemic, because learning human anatomy is not in class and laboratory practicums face-to-face but online. Therefore, it can be assumed that during the COVID-19 pandemic, educational institutions should use technology to select learning media. This is in accordance with Singhal's research in 2020, which stated that during the COVID-19 pandemic, education was recommended to facilitate virtual labour availability (22). So that students still get a good understanding of the material presented through the practicum method. This research is also in line with research stating that to increase students' understanding of the material obtained by the practical method, it is very effective to use a virtual laboratory (23).

Human anatomy material will likely be given through practicum through a virtual laboratory to utilize technology during the COVID-19 pandemic. Therefore, this matter needs to be considered by Health Education providers to achieve student competence related to understanding the anatomy of the human body. To overcome the lack of understanding related to the explanation given by the lecturer, students make independent learning efforts by looking for references related to the topic of the lesson. These references are obtained from books given or directed by lecturers for reading materials that can be read repeatedly. Participants revealed that books related to their majors had become a must-have, both printed and digital (e-books). Following the research, one of the efforts to increase student learning outcomes is to make the best use of existing learning resources (24). Learning resources are everything available around the learning environment that can be used to facilitate optimal learning outcomes.

In addition to printed or digital books, students also seek information by browsing journals related to learning topics, especially on Google and YouTube. For example, students look for videos related to the anatomy of the human body. This shows that digital media is very influential in the online learning process. Retnani's research in 2022 suggests that learning using online media in education is an innovation that aims to convey information to students through electronic media to increase student knowledge and skills (25). Similar to this study, it was found that students using online learning media will be a source of additional knowledge from the materials provided by the lecturer and become a way for students to be independent and become curious about the anatomy of the human body.

With the obstacles faced by students in studying the anatomy of the human body during the COVID-19 pandemic, students chose the hope of creating human body anatomy learning applications supported by pictures, interactive animations, videos, and explanations about the parts of the human body. Students also stated that animation would be interesting and exciting because animation is an image that can move. Therefore, this becomes an attraction for students when studying anatomy, which can be explored from various directions on the anatomy of the image. Furthermore, the animation will be more interesting if it is not solely in the form of black and white images yet can be added with different colours in each anatomical part. Therefore, the focus of the anatomy part that students will explore. This is in line with Miranto and Wardani in 2019, who showed that the application of bright colours was chosen for the reason of causing visual acuity so that users can more easily remember the information contained in it (26).

The shape of the anatomy is also expected to use 3D technology, where this feature will simplify and clarify from large parts to the smallest parts of the human anatomy, such as musculoskeletal which describes the skeletal framework, and cardiovascular, which describes the heart to blood vessels. This is in accordance with the previous research that 3D modelling is the process of making a three-dimensional surface mathematical representation of an object with certain software (27). In the medical world, using 3D models to describe the details of body organs. Participants also hope that the application of human anatomy will be accessible via smartphones to increase mobility

and efficiency when studying human anatomy. This follows Sholiqah and Agustina's research in 2019, which stated that learning 3D animation of the Android-based human anatomy system can improve student learning outcomes per the application of the given learning media (28). Therefore, applications with Android-based 3D features are assumed to improve student understanding in studying the anatomy of the human body.

CONCLUSION

The experience of health students in learning the anatomy of the human body during the COVID-19 pandemic is facing obstacles during the online learning process related to unstable internet signals, experiencing difficulties in understanding human anatomy learning due to not being supported by a practicum, efforts to increase knowledge sources in understanding body anatomy humans by browsing material on the internet and reading books independently and hoping for digital applications that make it easier to learn the anatomy of the human body. Therefore, this study recommends educational institutions use digital learning media to facilitate student understanding of studying human anatomy.

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Live experience of people with diabetes mellitus on self-management during COVID-19 in remote area of Indonesia

Experiencia en vivo de personas con diabetes mellitus sobre el autocontrol durante el COVID-19 en un área remota de Indonesia

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SUMMARY

Introduction: *People with Diabetes Mellitus (DM) are vulnerable to COVID-19. Therefore, it's important to maintain good self-management (diet, exercise, medicine, and health care visitations) during pandemics. Unfortunately, during the COVID-19 pandemic, it's difficult for them to maintain adequate self-management. Therefore, this study aimed to explore the self-management of people with DM during the pandemic, especially in a remote area of Indonesia.*
Methods: *This study is qualitative and uses the phenomenology method. The data was obtained from 10 people with Diabetes Mellitus using face-to-face interviews. Data collected was analyzed thematic using Atlas.ti software and statements from participants were presented verbatim to illustrate the themes realized.*
Results: *Participants' experience in self-management during COVID-19 was categorized into three themes and ten sub-themes. The three themes emerged from the study: psychological distress of being vulnerable to COVID-19, preferring traditional over medical treatment, and prejudgment toward healthcare workers and facilities.*
Conclusion: *Rural residents with DM experience psychological distress, leading to poor self-management and stigma toward healthcare workers and facilities. Therefore, it is important to do comprehension care consisting of self-management, psychological care, and education on the stigma around COVID-19 for people with DM.*

Keywords: *Comorbid, COVID-19 pandemic, type 2 diabetes mellitus, psychology distress.*

RESUMEN

Introducción: *Las personas con Diabetes Mellitus (DM) son vulnerables al COVID-19. Por lo tanto, es importante mantener un buen autocontrol (dieta, ejercicio, medicamentos y visitas médicas) durante las pandemias. Desafortunadamente, durante la pandemia del COVID-19, es difícil para ellos mantener una autogestión adecuada. Por lo tanto, este estudio tuvo como objetivo explorar el autocuidado de las*

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personas con DM durante la pandemia, especialmente en un área remota de Indonesia.
Métodos: *Este estudio es cualitativo y utiliza el método fenomenológico. Los datos se obtuvieron de 10 personas con Diabetes Mellitus mediante entrevistas cara a cara. Los datos recopilados se analizaron por temas utilizando el software Atlas.ti y las declaraciones de los participantes se presentaron palabra por palabra para ilustrar los temas tratados.*
Resultados: *La experiencia de autogestión de los participantes durante el COVID-19 se categorizó en tres temas y diez subtemas. Los tres temas surgieron del estudio: angustia psicológica de ser vulnerable a COVID-19, preferir el tratamiento tradicional al médico y el prejuicio hacia los trabajadores y las instalaciones de atención médica.*
Conclusión: *Los residentes rurales con DM experimentan angustia psicológica, lo que conduce a un autocontrol deficiente y al estigma hacia los trabajadores y las instalaciones de atención médica. Por lo tanto, es importante realizar una atención integral consistente en autocuidado, atención psicológica y educación sobre el estigma en torno al COVID-19 para las personas con DM.*

Palabras clave: *Comorbilidad, pandemia de COVID-19, diabetes mellitus tipo 2, angustia psicológica.*

INTRODUCTION

As of August 2022, about 6.3 million people in Indonesia are exposed to Coronavirus Disease (COVID-19), with 157 thousand of deaths. At the peak of rapid transmission in 2021 Indonesian government made lockdown regulations that affect many people, especially people with type 2 diabetes Mellitus (DM) and other chronic diseases who need regular checks on health facilities. In addition, people with chronic diseases are vulnerable to COVID-19. According to the WHO report, Diabetes Mellitus (DM) is a chronic disease that occurs in 422 million people worldwide (1). Centers for Disease and Prevention (CDC) revealed that the risk of death in people with DM increased by 11 % more than in people who did not have DM. As a result, 1.6 million people die from diabetes yearly (2). During COVID-19, people with DM have a high risk of dying (3–5). A previous study found that DM is a major risk factor for developing severe pneumonia and sepsis (6). In addition, the risk of death from COVID-19 is up to 50 % higher in people with DM than in those without (7), so it is essential to maintain self-management during a Pandemic for people with DM.

Self-management in DM patients is crucial, especially in maintaining blood sugar levels and preventing complications (8-11). DM self-management includes medication adherence, maintaining a proper diet for diabetes, regular exercise, and regular medical check-ups (12,13). DM patients who do proper self-management can improve self-care behaviour in type 2 diabetes patients, especially in maintaining blood sugar levels (1,12,14). Self-management in DM patients can also affect the quality of life of patients and families (8,15-17). The purpose of self-care is to manage the factors that effectively influence the development and condition of the client so they can maintain a healthy condition. The client's abilities and knowledge influence self-care behaviours. Self-care is important because it emphasizes a person's active role. Unfortunately, during COVID-19, it's difficult for people with DM to maintain adequate self-management. Previous studies stated that quarantine and lockdowns impact people with DM self-management like worsening glucose control, limited physical activities, difficulty getting medicine, and people with diabetes mellitus would not have been able to visit their physicians for the routine check-up (6,18,19). This condition can worsen in remote areas with limited health care, especially during pandemics.

Manggarai, located in East Indonesia, is one of the remote areas. Most of the locals worked as a farmer. There are only two hospitals and 21 public health centers for more than 312 thousand residents. In 2022 according to the health district of Manggarai, there are 9021 cases of COVID-19 and 21 dead. The most causes of the dead are comorbid illnesses like hypertension, diabetes mellitus, stroke, and heart disease. The lack of a healthcare system can be challenging for people with DM, especially during the pandemic. Previous studies stated that people with diabetes in remote areas in India face difficult challenges in self-management during the COVID-19 pandemic (20,21). Another study in Indonesia revealed that people with DM struggle to do self-management during pandemics and also experience psychological distress, but there is still limited qualitative study about the self-management of people with DM in remote areas

in eastern Indonesia (22). This study aimed to explore the experience of rural residents with DM in self-management during COVID-19.

METHODS

This study is a qualitative study that used a phenomenology approach. The goal of phenomenology is to describe the meaning of this experience—both in terms of what was experienced and how it was experienced (23). The participants in this study were 10 people with Diabetes Mellitus who were recruited using purposive sampling and interviewed face-to-face during their visit to the public health center in August of 2021. The interview questions focused on how people with DM maintain adequate self-management during COVID-19, the challenges, and the impact of the pandemic they experienced during COVID-19. Data was recorded and transcript verbatim. All the data were transcript anonym. Data were analyzed using thematic analysis with the help of Atlas.ti software. This study has been approved by the Committee Etic of Unika Santu Paulus Ruteng with number No.07/SK-IIIa/WAREK I-02/k/07/2021.

RESULTS

Participants in this study are 10 participants (7 female and 3 male) aged 41-65 years old. Most participants pursued formal education until high school (60 %) and the rest were elementary graduates. Most participants didn't work (60 %) and the rest worked as farmers and fishers. All the participants live with DM for about 3 – 13 years. Data analysis using Atlas.t resulted in 10 sub-themes and three themes. Three themes emerged from data analysis, namely Psychology distress of being vulnerable to COVID-19, preferring traditional over medical treatment, and prejudgment toward healthcare workers and facilities

Theme 1 Psychology distress of being vulnerable to COVID-19

Psychology distress of being vulnerable to COVID-19 consists of afraid of death if got COVID-19, paranoid about a family member who got COVID-19 or ignoring transmission prevention, anxiety and trouble sleeping if hearing other people with DM die because of COVID-19, Fear of going to the hospital because it can make them get COVID, and Ask a family member to go to the hospital or public health center to take their medicine.

Afraid of Death if Got COVID-19

Participants stated that people with DM are afraid they will die if they get COVID-19. Therefore, they realize DM will increase the risk of death.

"To be honest, I was afraid of death if I got COVID-19. We who have DM have a high risk of death if got COVID-19. If I hear my Neighbour or people from my circle got COVID-19, I am so afraid and don't want to go outside" (P2)

"One thing I am afraid the most if I got COVID is I will be dead. I feel so helpless with this condition" (P5)

Being paranoid about a family member who got COVID-19 or ignoring transmission prevention

Because of their condition, participants were afraid if a family member got COVID or merely ignored transmission prevention.

My daughter got COVID, and I asked her to stay outside the house and never meet me until she recovered. We communicate via video call as a mother, I want to take care of her, but my daughter and I don't want to take the risk if I got COVID-19 (P3)

I have to make sure my family member always does transmission prevention; they have to wear a mask if they go outside and do not meet me directly after going outside (P2)

Anxiety and trouble sleeping if hear other people with DM die because of COVID-19

The participant stated that they feel anxious and have trouble sleeping if they hear other people with DM die because of COVID-19.

One of my relatives who have DM died because of COVID-19. It makes me so anxious, and I can sleep for about three days. It also makes my blood sugar high. It is so frightening (P1)

Every time I read the news or watch TV about people with DM or hypertension who died because of COVID-19, I am so panicked and afraid. It makes me dizi and sometimes fatigued (P4)

Fear of going to the hospital because it can make them get COVID-19

The participant stated that they were afraid to go to a hospital because it can make them get COVID-19

I am afraid to go to the hospital because I can get COVID-19 from them. Every time I want to go to the hospital or public health care, I am scared and can sleep at night (P4)

Public health centers and hospitals are the sources of COVID-19, and I am too afraid to go there. What if I got COVID-19 and died? (P7)

Ask a family member to go to the hospital or public health center to take their medicine

The participant stated that they are afraid to go to the hospital or public health, so they ask a family member to take their medication.

I never go to the hospital or public health care during this pandemic. If I run out of medicine, I just ask my son to go to the hospital or public health center to take medicine. (P2)

I am afraid to go to the hospital, so I ask my daughter, who is healthier than me, to take medicine for me. (P6)

Theme 2: Preferring alternative over medical treatment

Preferring alternatives over medical treatment consists of consuming herbal medicine to maintain blood sugar, drinking herbal medicine because they are afraid to go to the hospital, and consuming Afrika leaf (Vernonia amygdalina), which traditionally believed to maintain sugar blood

Consume herbal medicine to maintain blood sugar

The participant stated that during the pandemic, they chose to drink herbal medicine, which they got from a herbal store.

I read in the news that herbal medicine from China can improve the immune system of people with DM. So, I consume it. It is easy to get also. (P5)

I drink a lot of herbal medicine during COVID-19 because people say it is good for me and can prevent me from dead if I get COVID-19 (P3)

Drink herbal medicine because they are afraid to go to the hospital

Some participants stated that they choose herbal medicine because it's easier to get and they are afraid to go to a hospital

I drink a lot of herbs because I run out of medicine and am too afraid to go to the hospital or public health care. I will go to the hospital if this COVID-19 ends (P1)

Using alternative medicine is safer than going to the hospital or public health to take medicine. You just take some leaves from the garden and produce the medicine. No contact with people or COVID-19 (P9)

Consume Afrika leaf (Vernonia amygdalina), which traditionally believed to maintain sugar blood

The participant stated they consume Afrika leaf (Vernonia amygdalina) to maintain their sugar blood**.**

During the COVID-19 pandemic, I always drank Afrika leaf three times a day. It can help decrease sugar blood and is also easy to get. (P2)

People in my village used Afrika leaf to cure diabetes Mellitus. During COVID-19, I drink the leaf every day, and it helps me (P10)

Theme 3: Prejudgment toward healthcare workers and facilities

Prejudgment toward healthcare workers and facilities consist of refuse to go to hospital and

public health center because they were the source of COVID-19, avoid meeting doctor or nurse directly because they can transmit COVID-19, and believing in conspiracy and hoaxes about COVID-19.

Refuse to go to hospitals and public health centers because they believe that the places are the source of COVID-19

Participants stated that they don't want to go to hospitals and public health centers because they believe hospitals and public health centers are the sources of COVID-19.

I don't want to go to the hospital or public health center because that place is the source of COVID-19. I hear some people got COVID-19 because they go to public health care. So why bother to go there (P4)

I am afraid to go to the hospital or public health center because people who got COVID-19 are there. We can make sure the doctor or nurse didn't transmit the virus to me. (P5)

Avoid meeting doctors or nurses directly because they can transmit the COVID-19

Participants stated they don't want to meet a doctor or nurse because they can transmit the COVID-19

I never go to the doctor or nurse during this pandemic because they can transmit the virus to me. They spend their day caring for people with COVID, and we don't know how safe their prevention is. It's better to avoid them. (P5)

Doctors, nurses, and hospital workers are the source of COVID-19. I think I will be safe. I didn't go near them, so I don't want to go to the hospital or public health center during this COVID-19. If I need medicine, I ask my son to buy it in a drugstore (P6)

Believe in conspiracy and hoaxes about COVID-19

Participants stated that they believe COVID-19 is propaganda made by healthcare and government

I think some people didn't have COVID-19, but the hospital and public health center say he got COVID-19 to make us afraid. (P4)

COVID-19 is a hoax, and it is propaganda made by the government and health staff, so we spend money on the health system and pay for BPJS (public health insurance) (P6)

DISCUSSION

Participants in this study stated they feel psychological distress like being afraid of death if they got COVID-19, being paranoid if they know a relative who got COVID-19, and anxiety thinking about other people with DM who died because of COVID-19. Previous studies also found This belief happens because they read the news, are told by a healthcare worker, and also have relatives with DM who died because of COVID-19. Psychological distress has reduced the immune system, making people vulnerable to COVID-19 (24-28). Stress in diabetic patients also can decrease adherence (29). A previous study found that stress management in people with DM can also reduce the level of glucose (30,31). So, it's important to maintain stress management during COVID-19, especially for people with DM during a pandemic. It is important to meet not just the physical but also the psychosocial needs of people with DM.

Participants in the study stated that they prefer alternative treatment to medical treatment during COVID-19 because it is easier to get. They chose alternative treatment because they were too afraid to go to the hospital or public health, which they assume is the source of COVID-19. The practice of alternative medicine during COVID-19 is commonly known in Indonesia. The consumption of Jammu during the COVID-19 pandemic is believed to improve the immune system (32). In this study, a participant stated that they use Afrika leaf or Vernonia amygdalina to reduce sugar blood levels. A previous study has found that vernonia amygdalina has little effect on decreasing glucose in diabetic rats (22), but there is still no study on humans. The practice of herbal medicine to treat DM has also been known globally. In a remote area in India, people used plants like begonia roxburghii, calamus tenuis, and many more (33). But there is no evidence of the effect of herbal medicine on humans, so the best treatment to control sugar blood levels is medical treatment. Therefore, it is important to

emphasize the importance of medical treatment to improve the quality of life of people with DM. Public health facilities must find a way to make medical treatment accessible and affordable.

Participants in this study stated that they don't want to go to a hospital or public health center because they assume that hospitals and public health centers are the sources of COVID-19. During COVID-19, healthcare workers often experience stigma from the public, especially because they take care of and have close contact with COVID-9 patients (34,35). Stigma and prejudgement happened because of fear, anxiety, and limited knowledge (36). In this study, participants refuse to go to the hospital due to irrational fear of COVID-19. This can worsen the diseases, as medical check-ups are important to maintain blood sugar and prevent complications. Therefore, education about COVID-19 is important for chronic patients. Previous studies suggested that having better knowledge will diminish irrational fear, anxiety, and stigma and is associated with a less stigmatized attitude (37), so it's important to provide health education not only on self-management during COVID-19 but also to reduce stigma toward health care workers and facilities.

CONCLUSION

People with DM experience psychological distress, which leads to poor self-management and prejudgment toward healthcare workers and facilities. Therefore, it is essential to do comprehension care consisting of self-management, psychological care, and education about COVID-19 for people with DM.

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ARTÍCULO ORIGINAL

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Effect of the standard operating procedure Box Method to increase self-confidence and basic nursing skills of nursing students during the COVID-19 pandemic

Efecto del método de Cuadro de Procedimiento Operativo Estándar para aumentar la confianza en sí mismo y las habilidades básicas de enfermería de los estudiantes de enfermería durante la pandemia de COVID-19

Lidwina Dewiyanti Wea[1a]*, Paskaliana Hilpriska Danal[2a], Oliva Suyen Ningsih[3a]

SUMMARY

Introduction: *Coronavirus Disease 2019 (COVID-19) pandemic develops an overwhelming new challenge not only to public health but also to nursing education and the workforce. Online methods brought difficulties to laboratory practice. Thus, this study aimed to identify the effect of using the nursing procedure box method as a remote and active learning method on nursing students' basic nursing skills and self-confidence during a COVID-19 pandemic.*
Methods: *The study design used was a quasi-experimental one-test pretest-posttest. As many as 26 nursing students participated in the study recruited through simple random sampling. This study attempted to test the box method used by the student to take the practiced material independently at home. This box was filled with practice equipment, materials, and standard operating procedure for vital signs assessment. The intervention is given for four days for each student. The research instrument was used to measure the student's self-confidence, ability, satisfaction, and self-confidence in learning. The study result was analyzed using paired Students' t-test.*
Results: *There was a significant difference in nursing students' skills and self-confidence before and after the intervention (p value=0.0001).*
Conclusion: *The learning method using the standard operating procedure box is relevant to pandemic conditions when the nursing student is experiencing difficulty accessing learning materials and attaining the learning outcome. This study result is expected to become the reference for the nursing education institution to decide on the proper learning method that complies with the current global pandemic situation, thus increasing the quality of clinical learning outcomes and nursing education.*

Keywords: *COVID-19, learning method, nursing.*

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RESUMEN

Introducción: *La pandemia de la enfermedad por coronavirus 2019 (COVID-19) desarrolla un nuevo desafío abrumador, no solo para la salud pública sino también para la educación y la fuerza laboral de enfermería. Los métodos en línea trajeron dificultades a la práctica de laboratorio. Por lo tanto, este estudio tuvo como objetivo identificar el efecto del uso del*

método de la caja de procedimientos de enfermería como un método de aprendizaje remoto y activo en las habilidades básicas de enfermería y la confianza en sí mismos de los estudiantes de enfermería durante una pandemia de COVID-19.
Métodos: *El diseño de estudio utilizado fue un pretest-postest cuasi-experimental de una sola prueba. Hasta 26 estudiantes de enfermería participaron en el estudio reclutados a través de muestreo aleatorio simple. Este estudio intentó poner a prueba el método de caja utilizado por el alumno para llevar el material practicado de forma independiente en casa. Esta caja se llenó con equipo de práctica, materiales y procedimientos operativos estándar para la evaluación de signos vitales. La intervención se da durante cuatro días para cada estudiante. El instrumento de investigación se utilizó para medir la autoconfianza, la capacidad, la satisfacción y la confianza en sí mismo del estudiante en el aprendizaje. El resultado del estudio se analizó utilizando la prueba t de Student pareada.*
Resultados: *Hubo una diferencia significativa en las habilidades y la confianza en sí mismos de los estudiantes de enfermería antes y después de la intervención (valor de p = 0,0001).*
Conclusión: *el método de aprendizaje que utiliza el cuadro de procedimiento operativo estándar es relevante para las condiciones de pandemia cuando el estudiante de enfermería experimenta dificultades para acceder a los materiales de aprendizaje y lograr el resultado del aprendizaje. Se espera que el resultado de este estudio se convierta en la referencia para que la institución de educación en enfermería decida sobre el método de aprendizaje adecuado que cumpla con la situación actual de pandemia mundial, aumentando así la calidad de los resultados del aprendizaje clínico y la educación en enfermería.*

Palabras clave: *COVID-19, m***étodo de** *aprendizaje, enfermería.*

INTRODUCTION

The current global COVID-19 pandemic causes a high rate of transmission and mortality worldwide (1-3). This situation is overwhelmingly challenging for global health, the food industry, and the workforce (4-7). The COVID-19 crisis impacts every social sector, including food security, public health, and employment (8,9). The main aim of COVID-19 control is to control virus transmission and prevent morbidity and mortality related to the disease. In responding to the COVID-19 pandemic, every country must employ comprehensive action considering local context and disease epidemiology (10).

The prevention measures with public health approach and social participation are contributing to stopping the individual transmission chain and preventing disease transmission (11). One of the prevention measures is to maintain physical and social distancing in public places to prevent transmission from the infected individual to the healthy individual and protect the high-risk group from the complication (12). Besides physical distancing, they were reducing or canceling the mass gathering and avoiding crowded spaces with the specified regulation (such as public transportation, restaurants, bars, and theatres), staying at home, and supporting the modification in the workplace or education institution regulation. World Health Organization (WHO) recommends a minimal range of physical distance of at least one meter between individuals to decrease inter-individual transmission risk (10).

The Indonesian government is also issuing several policies on public social activities limitation. This policy is regulated and issued by the Ministry of Health. The said regulation includes the Minister of Health Decree on COVID-19 prevention (13) and control guidelines in office/workplace and industry (14). These policies became the national reference that was later adapted to each business unit, private and government institution conducting their social activities during a pandemic.

The government policy regarding COVID-19 control is naturally imposed on the educational institution. Most higher education applications, including nursing education, are currently online and remote learning as alternative learning methods during a pandemic (15). As one of the health sciences, the learning outcome of nursing science includes practical skill competency. Nursing education consists of an academic and professional program that emphasizes the student's capability development to become academic and professional. Nursing students have to achieve the learning outcome based on the level 7 Indonesian Qualification Framework (KKNI), which consists of 4 components: attitude, general and specific skills, knowledge and working responsibility, and accountability (16).

In the COVID-19 pandemic era, the learning method of nursing education has changed (17). The lecturer and educator must modify their learning strategy that fits the pandemic policy and maximizes the learning outcome, specifically on nursing skills. During a pandemic, students are restricted from doing laboratory and clinical practice (18). A previous study identified the use of the box method contained with basic nursing skills instrument to measure temperature, pulse rate, respiratory rate, catheterization, and personal protective equipment (PPE) that the student can use to do self-practice at home, and the effectivity was measured afterward by questionnaire (19).

The initial interview with ten bachelors of nursing students stated that 80 % of the students feel it difficult to evaluate their practical nursing skills because they have no chance to practice the nursing skills in the laboratory or the clinic. This becomes a significant challenge for attaining basic nursing competency, the required skill for nursing students in their first, second, and third years. One of the solutions for the practical skill learning issue is using different methods that ensure the student can practice the nursing intervention independently and with lecturer supervision while in the framework of online and remote learning. Based on the challenge stated above, the researcher attempts to identify the effect of the box method on increasing the self-confidence and basic nursing skills of nursing students during the COVID-19 pandemic.

METHODS

Study Design

This study is a quantitative study with a quasi-experimental approach. The study used a quasi-experimental one-test Pretest-Posttest Design. This study was conducted from February to April 2022.

Population and Sample

The population in this study was second-semester nursing students of bachelor of nursing, as many as 224 students divided into eight classes. Sample size calculation uses the previous research as the reference (20) by using mean difference sample calculation (21), with a calculation result of 24. Therefore, the sample of this study is 26 respondents adding the possibility of dropouts.

Instruments

Data were collected by using the satisfaction and self-confidence in learning questionnaire. This questionnaire includes 13 items, consisting of 5 items for student satisfaction and 8 for the Self-confidence question with choices using a Likert scale of 1 – 5 (Strongly Disagree – Strongly Agree). The questionnaire has tested its validity and reliability with a reliability test result of 0.963.

Procedure

The students were given the learning theory of vital sign assessment using an online tutorial through zoom. Practical material using tutorial video. After being given the above method, students were given the pretest. Then, the students were given the box containing the standard operating procedure and instruments for measuring the vital sign. The students who participated were 26 people divided into nine groups. One student from each group takes the method box to the campus laboratory, brings it home for three days, and returns the box to the laboratory on the third day to be used by another student. To ensure that students use the method box to practice at home, the researcher asks the student to record the practice and send them to google drive. Finally, on the fourth day, the students were given the post-test.

Data Analysis

The data in this study were analyzed using SPSS software with a Students t-test and p-value <0.05.

Ethical Clearance

This study has been approved for its' ethical clearance by Research and Community Service, Universitas Katolik Indonesia Santu Paulus Ruteng on 13 January 2022, number 52/USP/R01/PE02/K/01/2022

RESULTS

This study was conducted on 26 nursing students in the second semester of the bachelor of nursing study program and the characteristics of nursing students (Table 1). In addition, normality tests were conducted before the Students' t-test with the Shapiro-Wilk test (Table 2).

Table 1

Nursing Students' Characteristics

Students' characteristics	f	%
Gender		
Male	10	38.5
Female	16	61.5
Total	26	100.0

Table 2

Normality test (n=26)

	Test of Normality		
		Shapiro – Wilk	
Posttest total	0.945	26	0.175

Table 3 is the output of descriptive statistics from the pretest and post-test. The different results of the pretest are that the mean value is 39.65, and the mean value for the post-test is 55.08. The number of respondents is 26 people. The standard deviation value in the pretest is 10.684, and the value of the standard deviation for the post-test is 5.578. The results of the standard error of the mean in the pretest are 2.095, and the post-test is 1.094. The mean score of the pretest is 39.65. The mean score post-test is 55.08, so there is a difference in the mean before and after the intervention. The output of the paired samples tests how high the significance of the difference between the pre and post-tests is. From the results of the paired samples test, the value of Sig. (2-tailed) is 0.0001 where the value is 0.05, so it can conclude that effect of the SOP box intervention on increasing students' skills and confidence in basic nursing subjects. Table 3 also assesses the mean paired difference, where the result is -15.423. The value of -15.423 shows the difference between the mean change in skills and student confidence before the intervention and the mean skills and confidence of students after the intervention. The pretest value is 39.65 – 55.08 = -15.423. The difference between -20.553 to -10.293 is a significant level of 95 % (Confidence Interval of the Difference).

Table 3

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest total	39.65	26	10.684	2.095
	Post-test	55.08	26	5.578	1.094

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95 % Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest – Post-Test	-15.423	12.700	2.491	-20.553	-10.293	-6.192	25	0.0001

DISCUSSION

Online learning during a pandemic become a significant challenge for students due to several factors such as internet network difficulties, internet data, fulfilling online learning and task with a shorter deadline, and difficulties in consulting directly with the lecturer or teacher (22). The academic institution has to provide an alternative method of task completion for students with technological difficulties that are used in online learning (23).

Online learning creates confusion for students. As a result, they become passive and less creative and productive, unclear information and concept, and students experience stress and even decreased literacy (24). Based on the previous study, students' independence level of learning during a pandemic is at a moderate level caused of the transition of learning methods from face-to-face to online learning. Therefore, students have to be given a more effective method to achieve their learning outcomes, especially nursing students who are demanded to master the theory and skill as future health professionals (25).

This study result showed that the learning method using a box of the standard operating procedure is relevant to the pandemic where students have difficulty accessing learning resources. Furthermore, the result showed significant differences, and Hwang and Chang 2020 stated that nursing academics have to identify the innovative learning method for more effective learning so that students can increase their knowledge and skills based on the learning outcomes to be more professional nurses even in the time of pandemic restrictions (26).

Therefore, a standard operating procedure box is one of the effective methods that nursing lecturers can use. This method enables the lecturer to evaluate the student's skills and increase their self-confidence. However, during the COVID-19 pandemic, students try to comprehend the learning materials virtually; however, they express their worries about being unable to meet the skill competency because of the restrictions to do the clinical practice. This condition demands the modification of the learning method that can overcome the student's problem (27).

The standard operating procedure box method also has other advantages for the students such as the ability to express their critical thinking, communication skills, and the ability to identify problems. The students were given the time to practice repeatedly at home until they understood the practical skills. The simulation method enables the student to practice the nursing skill and reflect on their ability to identify and verbalize the change in the situation using their critical thinking ability (28).

The COVID-19 pandemic brought changes to the nursing education system. The changes also bring in a new opportunity that can be used to achieve learning outcomes. This transformation demands their academics and nursing students to have high motivation to achieve the desired outcomes; however, the pandemic creates anxiety among the students about their future. As stated in the education curriculum, the lecturer must create the appropriate strategy to support the student's needs and develop emotional resilience (29). Facilitating the student's interaction through task play and ask-summary-watch strategy is important.

Online learning causes lesser interaction and active learning (30). in this study, students were facilitated to interact with others when they conducted the simulation at home. This is different from online learning, where there is no direct contact with others. Like the tutorial video method, students watch the pre-recorded simulation video using the learning material but have no interaction during the learning process. Besides, the standard operating procedure box method helps students with internet inaccessibility. Therefore, this method helps decrease students' anxiety about learning during a pandemic, increasing their academic performance. However, this study has a limitation because it only used a pilot project to test a learning method during the COVID-19 pandemic. Furthermore, this study does not use a control group.

CONCLUSION

The standard operating procedure box method is relevant to the current pandemic situation when

students experience difficulties in accessing the learning resources and achieving the learning outcomes. This method was proven to increase the student's skills and self-confidence in the clinical practice of basic nursing skills. Even with the small sample size, this pilot project can be one of the methods of practical nursing courses during a COVID-19 pandemic and in an area with limited access to learning resources. This method can also be used as a reference for future nursing education. The researcher suggests studying this learning method with a control group design for future studies.

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Risk factors of increased blood pressure among adolescents in rural areas of Indonesia

Factores de riesgo del aumento de la presión arterial entre los adolescentes de las zonas rurales de Indonesia

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SUMMARY

Introduction: *Hypertension in adolescents can increase mortality and morbidity rates, affecting productivity decline in adolescents. The prevalence of hypertension in adolescents is increasing and is often not realized by adolescents. This study aimed to identify risk factors for increased blood pressure in adolescents in rural areas.*
Methods: *This study uses a cross-sectional study design carried out in May 2022 in one of the senior high schools in Manggarai Regency, East Nusa Tenggara. The sample in this study was students aged 13-18 years (n=44) based on the inclusion criteria. The sampling technique used was convenience sampling with data analysis using Chi-Square.*
Results: *The results showed that adolescents with normal blood pressure were 31 respondents (70.5 %), while an increase in blood pressure was 13 respondents (29.5 %). There was a significant relationship between smoking (OR =0.173, 95 % CI 0.038-0.785, p-value 0.016) and a history of alcohol consumption (OR= 4,000, 95 % CI 1.009-15.862, p-value 0.042) with an increase in blood pressure in adolescents. Gender, family history of hypertension, physical activity, and a high salt diet did not have a significant relationship with an increase in blood pressure in adolescents with a p-value > 0.05.*
Conclusion: *Adolescents with smoking habits and alcohol consumption have a greater chance of experiencing an increase in blood pressure. Health workers need to screen for increased blood pressure and educate the impact of alcohol and smoking on adolescents to prevent an early increase in blood pressure.*

Keywords: *Adolescents, alcohol, blood pressure, smoking.*

RESUMEN

Introducción: *La hipertensión arterial en adolescentes puede aumentar las tasas de mortalidad y morbilidad, afectando la disminución de la productividad en los adolescentes. La prevalencia de la hipertensión en los adolescentes está aumentando y, a menudo, los adolescentes no se dan cuenta. Este estudio tuvo como objetivo identificar los factores de riesgo para el aumento de la presión arterial en adolescentes en áreas rurales.*
Métodos: *Este estudio utiliza un diseño de estudio transversal realizado en mayo de 2022 en una de las escuelas secundarias superiores en Manggarai*

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Regency, East Nusa Tenggara. La muestra en este estudio fueron estudiantes de 13 a 18 años (n=44) según los criterios de inclusión. La técnica de muestreo utilizada fue el muestreo por conveniencia con análisis de datos mediante Chi-cuadrado.

Resultados: *Los resultados mostraron que los adolescentes con presión arterial normal fueron 31 encuestados (70,5 %), mientras que un aumento de la presión arterial fue de 13 encuestados (29,5 %). Hubo una relación significativa entre fumar (OR = 0,173, IC 95 % 0,038-0,785, valor p 0,016) y antecedentes de consumo de alcohol (OR = 4 000, IC 95 % 1,009-15,862, valor p 0,042) con un aumento en la presión arterial en adolescentes. El género, los antecedentes familiares de hipertensión arterial, la actividad física y la dieta rica en sal no tuvieron una relación significativa con el aumento de la presión arterial en adolescentes con un valor de p > 0,05.*

Conclusión: *Los adolescentes con hábitos de tabaquismo y consumo de alcohol tienen mayor probabilidad de experimentar un aumento de la presión arterial. Los trabajadores de la salud deben detectar el aumento de la presión arterial y educar sobre el impacto del alcohol y el tabaquismo en los adolescentes para prevenir un aumento temprano de la presión arterial.*

Palabras clave: *Adolescentes, alcohol, presión arterial, tabaquismo.*

INTRODUCTION

Hypertension is a growing problem and might be happened at all periods of age (1,2). Hypertension is a long-term health problem and a leading cause of premature death in adults worldwide, including in developed and developing countries (3-6). Unfortunately, hypertension in children and adolescents is often neglected and continues into adulthood (7). A study conducted by the Centers For Disease Control (CDC) reports that one in 25 adolescents aged 12-19 years has hypertension, and one in 10 has increased blood pressure (prehypertension) (8). In Indonesia, the prevalence of hypertension in adolescents is increasing (9). Several studies conducted in Indonesia found that out of 1 200 adolescents, as many as 8 % of adolescents experienced hypertension and 12.2 % with increased blood pressure (Prehypertension). Adolescents in several high schools experienced hypertension as much as 42.4 % (9,10). In East Nusa Tenggara Province, 11.54 % of those with hypertension came from the 18-24 year age group, and only 3.21 % of those who routinely took blood pressure measurements (11).

Hypertension in adolescents is a growing problem throughout the world, along with the obesity epidemic and lack of physical activity is a risk factor for hypertension in adolescents (7,12). Hypertension in adolescents is usually associated with cardiovascular risk factors such as obesity and other risk factors (1,12,13). Several risk factors for hypertension in adolescents include a high-salt diet, poor diet quality, sleep disturbances (quality and duration of sleep), overweight or obesity, lack of physical activity, family history of hypertension, genetic factors, and psychosocial factors such as ethnicity, level of socioeconomic status and mental health (14-16). Another study regarding risk factors for hypertension in adolescents in rural areas showed that one-fifth of the sample (22 %) who had an increase in systolic blood pressure had elevated salivary cotinine levels, which indicates tobacco use and exposure to cigarette smoke. Age, gender, waist circumference, and salivary cotinine contributed to 36.4 % of the variance in systolic blood pressure and 19.1 % of the variance in diastolic blood pressure (17). A systematic review reported the long-term impact of increased blood pressure in adolescents on cardiovascular morbidity and mortality in adulthood (7). Several recent studies have shown that individuals who maintain an ideal profile of cardiovascular risk factors in adolescence to young adulthood significantly reduce the risk of all cardiovascular diseases and have a better quality of life in adulthood (6,18,19).

Screening of risk factors for increased blood pressure in adolescents is essential to identify early and prevent the development of hypertension in adolescents. Previous research has examined risk factors for hypertension in adolescents, such as obesity and family history (20), level of knowledge (21), gender, history of hypertension, nutritional status, physical activity, and stress (9). However, no studies examine risk factors for increased blood pressure in adolescents in rural areas. Therefore, our study aimed to identify risk factors for increased blood pressure in adolescents in rural areas.

METHODS

This study uses a cross-sectional design in May 2022 in one of the senior high schools in Manggarai Regency, East Nusa Tenggara. The sampling technique used was convenience sampling based on inclusion criteria. The sample in this study was teenagers in high school who met the inclusion criteria, totaling 44 respondents. Inclusion criteria are adolescents aged 13-18 years who do not have any congenital abnormalities that have the potential to increase or decrease blood pressure. The independent variables in this study were gender, smoking, alcohol consumption, family history of hypertension, physical activity, and a high-salt diet. The dependent variable is an increase in blood pressure. The instruments used are questionnaires for screening the risk of hypertension, blood pressure meters, stethoscopes, and anthropometric measuring instruments. The hypertension risk screening questionnaire includes respondent identity (name, gender), health profile (height, weight, body mass index/BMI, blood pressure), hypertension risk factors (family history of hypertension, smoking, alcohol consumption, physical activity such as regular exercise, diet high in salt and habits of consuming vegetables and fruit, duration and sleep patterns) (9). Data analysis used bivariate analysis with Chi-Square. This research has received ethical approval from the Ethics Committee of Universitas Katolik Indonesia Santu Paulus Ruteng with no 50a/USP/R01/PE02/K/01/2022.

RESULTS

Table 1 showed the profile of risk factors for increased blood pressure in adolescents shows that most of the adolescents are female, as many as 31 (70.5 %), obese as much as 2 (4.5 %), overweight as many as 7 (15.9 %), and family history with hypertension as much as 28 (63.6 %), smoking 10 (22.7 %), no physical activity 40 (91 %), alcohol consumption 14 (31.8 %), inadequate sleep duration as many as 17 (38.6 %), did not consume vegetables and fruit as much as 22 (50 %), and increased blood pressure as many as 13 (29.5 %).

The results of bivariate analysis based on Table 2 show that there is a significant relationship between smoking (OR 0.173, 95 % CI 0.038-0.785, p-value 0.016) and a history of alcohol consumption (OR 4,000, 95 % CI 1.009-15.862, p-value 0.042) with increased blood pressure in adolescents.

DISCUSSION

The results of our study show that quite a number of adolescents have increased blood pressure. One of the risk factors that is significantly associated with increased blood pressure in adolescents is smoking. Adolescents who smoke have a higher risk of developing blood pressure than adolescents who do not smoke, with an odds ratio of 0.173. The results of this study are supported by research that states that adolescents exposed to any type of tobacco smoke are likely to experience an increase in blood pressure compared to adolescents who are not exposed to tobacco smoke, with an odds ratio of 1.31 (95 % CI 1.01-1.61) (22). Another study conducted in rural areas showed that tobacco use and exposure to cigarette smoke are significant risk factors associated with increased blood pressure in adolescents in rural areas (17,23). However, the results of this study contradict several studies which state that there is no significant relationship between smoking and hypertension or increased blood pressure in adolescents (24-26)where were randomly selected from Junior High Schools in Central Jakarta. Information about family history, race/ethnic, birth weight, physical activity levels, smoking and consumption of alcohol was gathered by questionnaire. Body weight, height, and blood pressure were measured. Hypertension was defined according to the Fourth Report of National High Blood Pressure Education Programme Working Group on High Blood Pressure in Children and Adolescent. The study included 313 adolescents with mean age 13.97±1.02 years. Prevalence of hypertension was 9.6%. Bivariate analysis showed that family history of hypertension (parental hypertension; p = 0.012; CI 95% = 1,20-6,02. Smoking habits are one of the factors that have been shown to cause an increase in blood pressure in adolescents. Chemical substances and nicotine

Table 1

Profile of Risk factors for Increased Blood Pressure in Adolescents (n=44)

Risk factors		n	%
Gender	Female	31	70.5
	Male	13	29.5
Body Mass Index (BMI)	Underweight	6	13.6
	Normal	29	65.9
	Overweight	7	15.9
	Obesity	2	4.5
Family History of Hypertension	Yes	28	63.6
	No	16	36.4
Smoking	Yes	10	22.7
	No	34	77.3
Physical Activity	Yes	4	9.0
	No	40	91.0
Alkohol Consumption	Yes	14	31.8
	No	30	68.2
Sleep Duration	Adequate	27	61.4
	Inadequate	17	38.6
High-Salt Diet	Yes	31	70.5
	No	13	29.5
Increased Blood Pressure	Yes	13	29.5
	No	31	70.5
Total	44	100	

Table 2

Bivariate Analysis: Risk Factors for Increased Blood Pressure in Adolescents (n=44)

Variable	Increase blood pressure				Total		OR	95 %CI		p-value
	Yes		No							
	n	%	n	%	n	%		Lower	Upper	
Gender										
Male	7	15.9	6	13.6	13	29.5	0.340	0.086	1.349	0.118
Female	24	54.5	7	15.9	31	70.5				
Smoking										
Yes	4	9.1	6	13.6	10	22.7	0.173	0.038	0.785	0.016
No	27	61.4	7	15.9	34	77.3				
Alkohol Consumption										
Yes	7	15.9	7	15.9	14	31.8	4.000	1.009	15.862	0.042
No	6	13.6	24	54.5	30	68.2				
Family History of Hypertension										
Yes	9	20.4	19	43.2	28	63.6	0.704	0.177	2.802	0.704
No	4	9.1	12	27.3	16	36.4				
Physical Activity										
No	11	25.0	29	65.9	40	91.0	0.379	0.047	3.034	0.347
Yes	2	4.5	2	4.5	4	9.0				
High-Salt Diet										
Yes	10	22.7	21	47.8	31	70.5	0.630	0.141	2.806	0.543
No	3	6.8	10	22.7	13	29.5				

Note: OR = Odds Ratio; CI: Confidence Interval

content in cigarettes can cause injury to blood vessels it can increase the risk of increasing blood pressure. Smoking habits in adolescents can be influenced by environmental factors, culture, and parents who have smoking habits. Cigarettes are often used in traditional events of the Manggarai community, East Nusa Tenggara. This is one of the factors that trigger teenagers to have a smoking habit. If this habit lasts into adulthood, adolescents are at risk of developing cardiovascular problems in adulthood.

The habit of consuming alcohol is one of the factors that contribute to increasing the risk of hypertension in adolescents. Adolescents who consume alcohol have a higher risk of increasing blood pressure compared to adolescents who do not consume alcohol, with an odds ratio of 4 000. Alcohol consumption can increase plasma cortisol. Cortisol is a type of steroid hormone where excess cortisol can cause an increase in blood pressure in normotensive individuals (27). Recent epidemiological and clinical studies have shown chronic ethanol consumption (more than three drinks per day, 30 g of ethanol) is associated with increased hypertension and increased risk of cardiovascular disease (28). A systematic review and meta-analysis found that compared with individuals who did not consume alcohol at 10 g/day and 11-20 g/day had a tendency to increase the risk of hypertension (Relative risk [RR] 1.03; 95 % CI 0.94-1.13; P=0.51) and, (RR 1.15; 95 % CI 0.99-1.33; P=0.06 (29). Cultural factors can influence alcohol consumption habits in adolescents. Alcohol is often served in every celebration, traditional ritual, and the main meal in welcoming guests. This habit is often imitated by teenagers when they gather with their peers. If the habit of consuming alcohol in adolescents is not prevented, it will impact increasing blood pressure adolescence.

CONCLUSION

Smoking habits and alcohol consumption are risk factors for increasing blood pressure in adolescents. Adolescents who have a habit of smoking and consuming alcohol have a higher risk of developing blood pressure compared to adolescents who do not smoke and consume alcohol. Therefore, screening for increased blood pressure in adolescents and education on the impact of alcohol and smoking need to be done to prevent an increase in blood pressure and reduce mortality and morbidity due to hypertension in adulthood.

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The correlation between working shifts and nurse's motivation in the implementation of handover in the surgical documentation room

La correlación entre la jornada de trabajo y la motivación del enfermero en la implementación de entrega en la sala de documentación quirúrgica

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SUMMARY

Introduction: *Nurses have a shift divided into morning, afternoon, and night shifts. One of the nurse's duties is to do handovers. If the handover is not done effectively, there will be an impact on carrying out nursing care. One of the factors that influence the implementation of handovers is motivation. Poor motivation can cause the duties and roles of nurses will not to be carried out properly. This study aimed to determine the correlation between work shifts and nurses' motivation in implementing handover.*
Methods: *This research was a descriptive correlation study using a cross-sectional design approach with a sample of 43 respondents. This study used a modified motivation questionnaire. The analysis used was univariate analysis using descriptive test and tendency central, and bivariate analysis using an alternative test, namely the Kolmogorov Smirnov test.*
Results: *The average age was 35.28 years old, and most females 76.7 %, had a professional nurse's education 58.1 %, and >10 years of working experience 37.2 %. The Kolmogorov-Smirnov correlation test obtained a p-value of 0.881, meaning there was no correlation between work shifts and nurses' motivation in implementing handovers.*
Conclusion: *This study suggests that for the hospital, it is expected that every head of the room always reminds the nurses to carry out handovers according to predetermined standards and always control each shift, especially during the night shift.*

Keywords: *Handover, Motivation, Nursing, Shift*

RESUMEN

Introducción: *Las enfermeras tienen los turnos divididos en mañana, tarde y noche. Uno de los deberes de la enfermera es hacer traspasos. Si el traspaso no se realiza de manera efectiva, habrá un impacto en la realización de los cuidados de enfermería. Uno de los factores que influyen en la implementación de los traspasos es la motivación. La falta de motivación puede provocar que los deberes y los papeles que ejercen las enfermeras no se lleven a cabo adecuadamente. Este estudio tuvo como objetivo determinar la correlación entre los turnos de trabajo y la motivación de las enfermeras en la implementación de la transferencia.*
Métodos: *Esta investigación fue un estudio correlacional descriptivo utilizando un enfoque de*

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diseño transversal con una muestra de 43 encuestados. Se utilizó un cuestionario de motivación modificado. El análisis utilizado fue el análisis univariado mediante prueba descriptiva y central de tendencia, y el análisis bivariado mediante una prueba alternativa, a saber, la prueba de Kolmogorov-Smirnov.

Resultados: *La edad promedio fue de 35,28 años, siendo la mayoría del sexo femenino 76,7 %, formación profesional de enfermería 58,1 % y >10 años de experiencia laboral cerca de 37,2 %. La prueba de correlación de Kolmogorov-Smirnov obtuvo un valor de p de 0,881, lo que significa que no hubo correlación entre los turnos de trabajo y la motivación de las enfermeras para implementar los traspasos.*

Conclusión: *Este estudio sugiere que, para el hospital, se espera que cada jefe de sala recuerde siempre a las enfermeras realizar los traspasos de acuerdo con estándares predeterminados y siempre controlen cada turno, especialmente durante el turno de noche.*

Palabras clave: *Traspaso, motivación, enfermería, turno.*

INTRODUCTION

Nurses are workers who play an important and responsible role in the health service process (1,2). Nurses are also workers who serve patients full-time (3-5). Every job or installation has a work shift division. Shift work is the method of setting work shifts chosen by a company or installation and is divided into three shifts: morning, afternoon, and night shifts. Based on Government regulations in 2021 Number 35 article 21 concerning working hours, it was stated that working hours had been stipulated in 2 provisions: the first provision is seven working hours in 1 day or 40 working hours for six working days in 1 week (6). In comparison, the second provision is eight working hours in 1 day or 40 working hours for five working days in 1 week. Handover is one of the nurses' duties in carrying out their role as health workers at every shift change (7,8). Handover aims to convey and receive information about the patient's condition (9,10). One of the factors that can affect the implementation of handover activities is motivation, and the task will not be carried out properly if there is no support from the will and motivation (11).

Handover is a technique or way to convey and receive something (report) related to the patient's condition. For example, caring for patients is delegated from nurses who have done service to nurses who will carry out further service. Patient handover must be implemented as effectively as possible by briefly, clearly, and thoroughly explaining the nurse's independent actions, collaborative actions that have been carried out or not, and the patient's progress at that time. Handovers that are carried out effectively will improve patient safety (9). One of the factors that can affect the implementation of handover activities is motivation, and the task will not be carried out properly if there is no support from the will and motivation (11). The factors that can affect motivation are intrinsic and extrinsic. Intrinsic motivation comes from within a person, not external rewards such as gifts, money, or values. Extrinsic motivation comes from the happiness that a person gets from satisfaction in completing or doing a job. This motivation refers to motivation that comes from outside the individual. It can be in the form of awards such as rewards, money, and values. This award provides satisfaction and pleasure for someone (12).

The impact can occur if everyone does not have motivation, such as less than optimal or maximal individuals doing everything and achieving something. The low performance of individual work is caused by low abilities and skills, lack of motivation, weak instructions, and lack of support for administrative implementation services. Someone whose work motivation is not good and has poor performance is due to a lack of work motivation (13). Work motivation is an important factor for nurses to carry out the tasks that have become their responsibility; without work motivation, the work will not be able to run well. If nurses' work motivation is high, then nurses can work properly. Hence, they can produce a good performance as well. Respondents whose work motivation is lacking and have poor performance are caused by a lack of work motivation, resulting in a decrease in performance results in their duties (14).

Based on the results of a preliminary study conducted by researchers related to work shifts and nurses' motivation to implement handovers in each shift. The researcher does not find handovers done at the nurse station but are carried out by a team and go directly to the patient's room. Sometimes handovers are no longer carried out in

the rooms; only the team knows the information. Moreover, when nurses were treating the patient, they also had to do a handover. As a result, the handover was done a little late. Based on the description above, the results obtained are that the implementation of handovers in the afternoon and evening shifts has not been carried out following the Standard Operating Procedures (SOP). Therefore, this study analysed the correlation between shift work and nurse motivation in handover implementation.

METHODS

The study was a quantitative method with a description of the correlation. This study used a cross-sectional design approach. This research was conducted at a hospital in Riau Province in the surgical inpatient room. The sample population was all nurses in the surgical inpatient room, with a total sample of 46 nurses from the two rooms. The inclusion criteria of this study were registered nurses who were willing to be respondents. The sampling technique used by the researcher was consecutive sampling. In this study, the independent variable was shift work, and the dependent variable was the motivation of nurses in the implementation of handover. The data instrument used in this study was a questionnaire. Univariate analysis in this study was conducted on research variables that include the characteristics of nurses consisting of age, gender, length of work, work shifts, and motivation of nurses in the implementation of handover using a frequency distribution table. The bivariate analysis in this study aimed to examine the correlation between work shifts and nurses' motivation in implementing handover. This study was declared to have passed the ethical test by the Sekolah Tinggi Ilmu Kesehatan Hang Tuah Pekanbaru committee with the number: 214/KEPK/STIKes-HTP/III/2022.

RESULTS

Based on Table 1, it is found that the average respondent was 35.28 years old. The minimum age of the respondent was 25 years, while the maximum age was 57 years.

Table 1

Frequency distribution of Respondent's Characteristics by Age

Age				
	Mean	Median	Std. Deviation	Min-Max
	35.28	34.00	7.826	25 – 57

Table 2

Frequency distribution of Respondents' Characteristics by Gender, Last Education, Length of Work, Shift Work, Nurse's Motivation

Characteristic	Frequency (f)	Percentage (%)
Gender		
Male	10	23.3
Female	33	76.7
Education Background		
Professional Nurses	25	58.1
Vocational Nurses	18	41.9
Length of Work		
< 6 years	15	34.9
6 - 10 years	12	27.9
> 10 years	16	37.2
Work Shift		
Morning	15	34.9
Afternoon	14	32.6
Night Shift	14	32.6
Motivation		
High	30	69.8
Low	13	30.2
Total	43	100.0

Based on the table above, the study's results indicate that most nurses were 33 female (76.7 %). The most recent education was professional nurses, with 25 people (58.1 %). The length of work with >10 years was 16 people (37.2 %). This study divided the number of nurses in each work shift into morning shifts for 15 respondents (34.9 %), afternoon shifts for 14 respondents (32.6 %), and night shifts for 14 respondents (32.6 %). The motivation of nurses was high motivation of 30 respondents (69.8 %), and the low motivation was 13 respondents (30.2 %).

Table 3

Results of the Correlation between Work Shift and Motivation

		Work Shift Distribution
Most Extreme Differences	Absolute	0.195
	Positive	0.195
	Negative	0.000
Kolmogorov-Smirnov Z		0.587
Asymp. Sig. (2-tailed)		0.881

The study's results in Table 3 show that the p-value was 0.881 > 0.005, which means that there is no correlation between work shifts and nurses' motivation in implementing handovers in the surgical inpatient room.

DISCUSSION

Age has an important role in influencing one's knowledge and experience; the older one gets, the more mature the way of thinking. Maturity can also increase motivation. If motivation increases, the work will also be completed well (15). Previous research states that women's work motivation is approximately 57.1 % higher than men. This is because women have a much better level of patience, and nurses are also a job based on the love of a woman. Thus women have a high enough work motivation (16). The level of education is also elevated one's knowledge. The higher a person's education, the easier it is to receive information to increase their knowledge (15). The longer the work, the better the caring behaviour of nurses compared to nurses whose tenure is still new. The longer the working period, the better their skills and work experience and the responsibility in carrying out their duties (17).

The results of the research conducted in the surgical inpatient room obtained the motivation of nurses in the morning shift in the high category. The results of statistical tests indicate that there is no significant correlation between shift work and nurses' motivation to implement handovers. This study is also in line with the previous research on the motivation of nurses to nurse compliance in the implementation of handovers which states that there is no significant correlation between nurses' motivation and compliance in the implementation of handovers (18). This is because the higher motivation of nurses has not determined that nurses carry out their duties well. Another possible thing is other factors that influence nurses in the implementation of handovers.

Based on Trinesa et al., in 2020 research on factors related to the implementation of handovers, it is stated that high motivation in implementing handovers can be caused by several factors such as the leadership of the head of the room, support from colleagues, and the surrounding environment (19). This is because the role of a good head of the room in guiding and paying attention to nurses in carrying out handovers will affect the motivation of nurses. In addition, colleagues who provide a positive response during the handover process will also increase enthusiasm for being responsible for carrying out their duties on the shift. This study's results align with research by Revalicha and Samian in 2013 on the level of work fatigue in each shift, which explains that night shifts cause more fatigue and decrease motivation in carrying out work (20). This is because the night shift negatively impacts the worker's body, namely, fatigue, sleepiness, and lack of enthusiasm in their duties.

Based on the description above, the result of this study is that there is no correlation between work shifts and nurses' motivation to undertake handovers. This is since each shift: morning shift, afternoon shift, and night shift, nurses have high motivation, which is more dominant. This is because the role of the head of the room, supervisors, and other senior nurses motivate their colleagues in undertaking handovers every morning. Thus, the implementation of handovers remains under supervision and control.

CONCLUSION

In conclusion, it can be drawn that the motivation of nurses is high. Most high motivation is on the morning shift, and the

majority of low motivation is on the night shift. It was discovered that nurses in the inpatient room have high motivation. This study finds no correlation between work shifts and nurses' motivation to implement handovers in the surgical inpatient ward.

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Correlation between parental verbal violence behaviour and the aggressiveness of adolescents

Correlación entre la conducta de violencia verbal parental y la agresividad de los adolescentes

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SUMMARY

Introduction: *The phenomenon of adolescents' aggressive behaviour today has never subsided and even tends to increase. The factors causing the high incidence of quarrels are still unknown, but family quarrels and parental exposure to childhood abuse are predictors of aggressiveness among adolescents. This study aimed to examine the relationship between parents' verbal violence behaviour and adolescents' aggressive behaviour.*
Methods: *A cross-sectional design was used in this study. A total of 122 high school students were selected as samples through simple random sampling. The variables in this study were verbal violence as an independent variable and adolescent aggressiveness as the dependent variable. Data was measured using a verbal violence questionnaire and an adolescent's aggressiveness questionnaire, which were tested for validity and reliability. The data were then analysed by the Spearman correlation test.*
Results: *Verbal violence committed by parents in mild verbal violence was 73.8 %, while as much as 68 % of the aggressive behaviour carried out by subjects was in the mild category. There is a significant correlation between verbal violence behaviour and aggressive behaviour in adolescents (p-value 0.0001) with r correlation = 0.510, a correlation with moderate strength.*
Conclusion: *Verbal violence by parents leads to more reproachful behaviour every time adolescents make mistakes; this affects the behaviour of adolescents, leading them to become irritable and commit harmful actions such as throwing, kicking, or slamming objects when they become angry. Parental understanding is needed to shift the punishment method positively to suppress the impact of aggressiveness that may appear in adolescents.*

Keywords: *Adolescent, aggression, emotional abuse, violence.*

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RESUMEN

Introducción: *El fenómeno de la agresividad de los adolescentes en la actualidad nunca ha disminuido e incluso tiende a incrementarse. Los factores que causan la alta incidencia de peleas aún se desconocen, pero*

las peleas familiares y la exposición de los padres al abuso infantil son predictores de agresividad entre los adolescentes. Este estudio tuvo como objetivo examinar la relación entre el comportamiento de violencia verbal de los padres y el comportamiento agresivo de los adolescentes.

Métodos: *En este estudio se utilizó un diseño transversal. Se seleccionó como muestra un total de 122 estudiantes de secundaria mediante un muestreo aleatorio simple. Las variables de este estudio fueron la violencia verbal como variable independiente y la agresividad adolescente como variable dependiente. Los datos se midieron mediante un cuestionario de violencia verbal y un cuestionario de agresividad de los adolescentes, cuya validez y fiabilidad se probaron. Luego, los datos se analizaron mediante la prueba de correlación de Spearman.*

Resultados: *La violencia verbal cometida por los padres en la violencia verbal leve fue del 73,8 %, mientras que hasta el 68 % de las conductas agresivas realizadas por los sujetos fue en la categoría leve. Existe una correlación significativa entre la conducta de violencia verbal y la conducta agresiva en adolescentes (p-valor 0,0001) con r correlación = 0,510, correlación con fuerza moderada.*

Conclusión: *La violencia verbal por parte de los padres conduce a conductas más reprobatorias cada vez que los adolescentes cometen errores; esto afecta el comportamiento de los adolescentes, llevándolos a irritarse y cometer acciones dañinas como arrojar, patear o golpear objetos cuando se enojan. Se necesita la comprensión de los padres para cambiar positivamente el método de castigo para suprimir el impacto de la agresividad que puede aparecer en los adolescentes.*

Palabras clave: *Adolescente, agresión, abuso emocional, violencia.*

INTRODUCTION

Exposure to violence has been a widespread social problem in societies worldwide that predicts serious adolescent maladjustment, including aggression (1-4). Aggression is known as a reaction that causes dangerous consequences for others (5,6). Many adolescents are unable to integrate well into society, often accompanied by conflict and personality problems, including increased aggressive behaviour (5,7-10). Adolescents are still widely known to commit acts of fighting between groups and interpersonal quarrels at school and in neighborhoods around their houses. The cause of the high incidence of altercations is still unknown. Mentions of verbal abuse, family quarrels, and parental exposure to childhood abuse are predictors of physical abuse among adolescents (11,12). Exposure to violence can be physical aggression (such as spanking) and non-physical aggression (such as verbal and relational aggression, name-calling, or the subject of negative speech) (1,13,14).

Adolescents show aggression with their peers to gain recognition. Overall, adolescents were the highest victims of aggression by peers (53.4 %) (1). The aggressiveness can be physical as through spanking, verbal as through name-calling, and relational as through causing social exclusion or property damage that can occur directly or over online media (15,16). Other studies mention there are four forms of aggressive behaviour: physical aggression, verbal aggression, anger aggression, and hateful aggression (17). The percentage of parents who reported verbal abuse and altercations with their children was 56 % (11). The percentage of people who claimed to have witnessed verbal abuse was 68.8 % (18). Based on preliminary studies, 20 students were found to be aggressive in school, for which 40 % of students have fought their peers, 40 % have bullied other children, and 20 % have bullied their friends.

Factors underlying the aggression in children are identifying family members who behave aggressively or violently, a conducive environment for aggression, or the lack of cooperation between schools and parents to overcome child aggression. In addition, internal factors may encourage the development of aggression, such as the ability to regulate emotions (17). Traumatic events in children are also known to occur most often due to having separated caregivers, finding out that someone died, and watching people fight (19).

The attack factor is the most common cause of aggressive behaviour, a disorder that affects others. The frustration factor is the failure to achieve goals, which also creates a motive to be aggressive toward other adolescents. The attack can be carried out by anyone, including the elderly (19,20). It has been mentioned that exposure to individual childhood violence (physical, verbal, and sexual) will negatively impact childhood to adulthood. Parenting behaviour also contributes to the development of negative beliefs (21).

Experiences of childhood abuse, especially from trusted figures such as parents, can result in the development of negative perceptions about oneself and others (21). In Germany, approximately 40 % of adolescents reported physical and verbal victimization by their parents during childhood (22). Violence against children by adults in the family is one of the most invisible forms of child abuse. It occurs in the privacy of domestic life but is also considered an acceptable cultural norm (11). The combination of family violence and forms of victimization has a more severe behavioural impact than on children who only witness family violence (23). Children experiencing violence may negatively affect their cognition, emotion, and behaviour, impacting their future academic performance (24). Children whose parents commit violent and verbal violence will do the same when they become parents themselves (11). The solution to minimizing the occurrence of aggressive behaviour in children is for all parties, parents, and schools, to be responsible in their roles. Early detection of negative manifestations and aggression will enable the implementation of preventive measures, thus correcting and preventing further negative impacts (25).

Knowing the factors and mechanisms that influence aggressive behaviour is known to help to develop interventions to control and reduce the occurrence of aggressive behaviour (26). Effective depression management will also reduce the impact on cognitive dysfunction (21). Parental awareness should be improved concerning the adverse impact of parental aggression in children's early stages of life (1). Parents should also show children more love, affection, and protection and avoid hitting or corporal punishment (11). This study intends to examine the relationship between parental verbal violence behaviour toward adolescents' aggressive behaviour.

METHODS

Study Design

The study utilized a design with analytical correlation and a cross-sectional approach. This study examined the correlation between verbal violence and adolescents' aggressiveness.

Population and Sample

The population in this study was all students in Lamongan, East Java, Indonesia. Sampling was conducted with simple random sampling. Participants needed to meet the inclusion criteria of being 16-18 years old, living with parents, understanding the purpose of this study, and volunteering to participate. From these, 122 participants were selected as the sample. Adolescents' aggressiveness is the dependent variable, and verbal violence is the independent variable. Both were investigated as research variables

Instruments

Verbal violence indicators are measured according to events experienced by children during the last three months. These are based on various types of verbal violence styles grouped into three categories: disrespect, offensive language, and expressing an intention to harm (27). The three groups of categories were then developed into several types of questions. The utilized instrument for measuring the history of verbal violence behaviour was a questionnaire on verbal violence that contained 11 items and had been modified for the research. Respondents meet the indicator of experiencing verbal violence if they get it within a period of 1-3 times in the last three months (0-point) and more than 3 times in the last three months (1-point). Based on this assessment, the scores obtained are categorized into no verbal violence (score 0), mild verbal violence (scores 1-3), medium verbal violence (scores 4-7), and severe verbal violence (scores 8-11).

The form of adolescents consists of physical and non-physical aggressiveness (28). Physical aggressiveness appears in several actions such as rude behaviour, retaliation, mischievous, and harmful behaviour. Meanwhile, non-physical aggressiveness includes intimidation, catcalling, and sexual harassment. Aggressive behaviour was measured with a questionnaire on aggressive behaviour that contained eight items and had been modified for this research. We determined the value category from the results of the calculation of the aggressiveness questionnaire with a 2-point score (yes=1,

no=0). There are the non-aggressive categories (score 0), low adolescents' aggressiveness (1-2), moderate aggressiveness (3-5), and high aggressiveness (6-8). Both measuring instruments had been tested for validity and reliability, with the r values of Cronbach's alpha being 0.935 and 0.929, respectively ($r > 0.404$; α 0.05).

Statistical analysis

Students could participate in the surveys after reading and filling out the consent form. The Spearman rank correlation test was utilized for data analysis with a value of $\alpha < 0.05$. Ethical approval (Reference No: 116/EC/KEPK-S2/02/2021) was obtained from the ethics committee of Universitas Muhammadiyah Lamongan.

RESULTS

Table 1 showed that the subjects consisted of male and female students, with female students being more dominant in proportion, with 95 subjects (77.9 %). The subjects were 16-18 years old, and the average age was 16.79 ± 0.752 years, with the majority being 17 years old (43.3 %). Subjects were questioned on their parents' characteristics, including their fathers' occupation and parental status. Of 122 subjects, parents were employed as entrepreneurs (64,8 %), and only a small percentage were unemployed (5.7 %). For their parent status, 110 subjects (90.2 %) were fostered by married parents, as both their fathers and mothers, while only 12 subjects (9.8 %) were fostered by single parents, specifically by their fathers.

The verbal appearance of violence made by parents was seen for the duration of the last 3 months. The results showed that the most common form of verbal violence carried out by parents was the form of offensive language. Parents verbally convey words of rebuke, especially when children make mistakes (63.9 %) (Table 2).

Indicators of aggressive behaviour carried out by the subject can be seen in Table 3. The indicators of aggressive behaviour carried out by the subject are dominated by harming behaviour (55.7 %), such as easily throwing, kicking, or slamming something when angry.

Based on Table 4, the category of verbal violence history involved verbal violence that subjects experienced from their parents in the last three months; 73.8 % of subjects reported having experienced mild verbal violence. On the other hand, the forms of aggressive behaviour performed by the subjects within the last three months were mostly indicated as mild aggressive

Table 1

Demographic Characteristic

Demographic Characteristic	n (%)
Gender	
Male	27 (22.1)
Female	95 (77.9)
Age	16.79 ± 0,752
16 years	44 (36.2)
17 years	53 (43.3)
18 years	25 (20.5)
Parent Occupation Status	
Unemployed	7 (5.7)
Civil servant	10 (8.2)
Entrepreneur	79 (64.8)
Farmer	26 (21.3)
Parent Status	
Single	12 (9.8)
Married	110 (90.2)

Table 2

Indicators of Parental Violence

Verbal Violence of Parents	%	Mean	SD
Disrespect			
Not showing care	20.5	0.20	0.405
Compare with others	25.4	0.25	0.437
Ignoring	4.1	0.02	0.199
Sidestepping	9.8	0.10	0.299
Avoiding	2.5	0.02	0.156
Offensive language			
Speak in a high tone	7.4	0.07	0.262
Accusing	11.5	0.11	0.320
Name-calling	0.0	0.0	0.0
Blaming for a mistake	63.9	0.64	0.482
Shouting at a mistake	54.9	0.55	0.500
Express an intention to harm (Threatening)	14.8	0.15	0.356

behaviour, by 68,0 %. This shows a significant correlation between verbal violence committed by parents and aggressive behaviour in adolescents, with a value of 0.0001 ($p < 0.05$) and a correlation value of (r) = 0.510, which shows a positive correlation with moderate correlation strength.

Table 3

Indicators of Aggressiveness

Aggressiveness of adolescents	%	Mean	SD
Physical			
Rude behavior	44.3	0.44	0.499
Retaliation	27.9	0.28	0.450
Mischievous	9.0	0.09	0.288
Harming behaviour	55.7	0.56	0.499
Non-physical			
Intimidation	0	0	0
Catcalling	11.5	0.11	0.320
Sexual harassment	0	0	0

Table 4

Correlation of Parental Verbal Violence Behavior and Aggressive Behavior

Categories	Mild	Medium
Verbal violence	90 (73.8 %)	32 (26.2 %)
Aggressiveness on adolescents	83 (68.0 %)	39 (32.0 %)

r = 0.510; p value 0.0001 ($p < 0.05$)

DISCUSSION

The results showed that most parents of students committed mild verbal violence. The verbal violence that was committed the most was offensive language. Parents blame and yell at the mistakes of adolescents. Previous results also showed that more than students experienced violence perpetrated by parents. The examined forms of verbal violence involved care expressions, intimidation, embarrassment, reproach, ignorance, face-to-face bullying victimization and perpetration, cyberbullying, and relational bullying (29,30). Students who experience such violence are 3.5 times more likely to be perpetrators of violence (31,32). It is known that external factors such as the influence of culture, parenting patterns, and psychosocial stressors influence parental violence (33). Some psychosocial stressors that can cause verbal violence in children are due to the indirect impacts of the COVID-19 pandemic, which may be job loss, hunger, and loneliness (29). Lockdown conditions and health protocols applied to the pandemic, such as stay-at-home orders and social distancing, give family members more time to interact, leading to microsystem factors that can make families more conflicted. Parents experience stress due to social distancing and the closure of schools and daycare facilities. There was an increase in violence toward children during the pandemic and an increase in verbal violence (34). The results showed that the parents' occupations were dominated by entrepreneurs. The coronavirus pandemic (COVID-19) period is known to have weakened several business sectors so that it might trigger household stressors. In addition, most of them are female adolescents, who are more required to maintain their morals, so the determination of strict rules can cause friction between parents and children.

Aggressive behaviour in adolescents was dominated by physical aggressiveness, which was a lot of harmful behaviour. The actions taken are generally throwing, kicking, and slamming objects. Early adolescents between 12-15 years of age enter an adaptation phase in which boys and girls begin to be exposed to information and experiences related to a new life stage. While late adolescence, which is between the ages of 16 and 18 years, is a period in which the information previously obtained will be used to build their own identity. In early adolescence, there are more conflict episodes, so the role of the family is very influential in determining adolescents' behaviour. Conflicts between parents and children are more common at this time (35). The family environment is known to play a role in helping adolescents to get better psychological well-being and quiet communication (36). Aggressiveness showed by adolescents as a form of response to various stimuli received. If the stimulus received is negative, it will also be shown with negative behaviour.

The results of this study showed a correlation between parents' verbal violence and the aggressiveness of children in adolescence. This

aggressive behaviour is due to verbal violence that they experience from their parents. This is in line with previous studies that showed that parents' verbal and physical violence and lack of care could lead to increased levels of paranoia in children (37). Early childhood trauma such as violence, neglect, and other harmful events, have a negative effect on early attachment relationships (38). Results of previous studies have shown that giving parenting workshops to parents can reduce the incidence of verbal violence and corporal punishment in children (39). Parents committing verbal violence to children has a bad impact on the children. Childhood trauma can be a contributing factor to adolescent aggressive behaviour. The existence of the family is the dominant environment around children. Indirectly, parents are role models for adolescents to build their behaviour. The main factors of parents, such as parenting, can be investigated further to determine the causes of aggressive behaviour in adolescents.

CONCLUSION

Verbal violence by parents leads to more reproachful behaviour every time adolescents make mistakes. This would affect the behaviour of adolescents, making them more irritable and prone to commit harmful actions such as throwing, kicking, or slamming objects when they become angry. Therefore, parental understanding is needed to make the punishment more positive to suppress the impact of aggressiveness that may appear in adolescents.

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Optimizing shift scheduling and work-life balance to improve job satisfaction among female nurses

Optimización de la programación de turnos y el equilibrio entre la vida laboral y personal para mejorar la satisfacción laboral entre las enfermeras

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SUMMARY

Introduction: *Among the numerous factors that can improve job satisfaction are challenging work, rewards that meet employees' expectations, a comfortable working environment, and a balance between personal life and work (work-life balance). This study analyzed the relationship between shift schedule arrangement and work-life balance among female nurses and its impact on job satisfaction.*

Methods: *This study adopted a cross-sectional approach. The population consisted of nurses who have civil servant status in one of the regional hospitals in Indonesia. The participants were recruited using proportionate stratified random sampling with 100 respondents. The variables included shift schedule arrangement, work-life balance, and job satisfaction. In addition, job satisfaction, shift schedules, and work-life balance questionnaires were collected. The analysis was tested using the Chi-Square test.*

Results: *Most participants (60 %) of the participating female nurses expressed satisfaction with their work, and their perceptions of shift scheduling and work-life balance were mostly positive. However, the proportion of nurses who perceived their work-life balance positively (65 %) was greater than the proportion who perceived their schedule positively (59 %). A Chi-Square test revealed a significant correlation between job satisfaction and three factors: education level (p-value 0,008; OR = 1.40), shift schedule arrangements (p-value 0.006; OR = 3.08), and work-life balance (p-value 0.016; OR = 2.82).*

Conclusion: *The finding showed a significant correlation between education level, shift schedule, work-life balance, and job satisfaction among female nurses. If there is no clear pattern to work shifts, nurses in inpatient units will experience greater working stress and declining job satisfaction. Organizations can help employees to improve their work-life balance*

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by introducing family-friendly policies such as flexible working hours.

Keywords: *Job satisfaction, nursing management, shift schedule, work-life balance.*

RESUMEN

Introducción: *Entre los numerosos factores que pueden mejorar la satisfacción laboral se encuentran el trabajo desafiante, las recompensas que cumplan con las expectativas de los empleados, un ambiente de trabajo cómodo y el equilibrio entre la vida personal y el trabajo (work-life balance). Este estudio analizó la relación entre la disposición del horario de turnos y el equilibrio entre la vida laboral y personal entre las enfermeras y su impacto en la satisfacción laboral.*
Métodos: *Este estudio adoptó un enfoque transversal. La población estuvo compuesta por enfermeras que tienen el estatus de servidor público en uno de los hospitales regionales de Indonesia. Los participantes fueron reclutados utilizando un muestreo aleatorio estratificado proporcional con 100 encuestados. Las variables incluyeron la disposición del horario de turnos, el equilibrio entre la vida laboral y personal y la satisfacción laboral. Además, se recogieron cuestionarios de satisfacción laboral, horarios de turnos y equilibrio entre la vida laboral y personal. El análisis se probó utilizando la prueba de Chi-cuadrado.*
Resultados: *La mayoría de las participantes (60 %) de las enfermeras participantes expresaron satisfacción con su trabajo, y sus percepciones sobre la programación de turnos y el equilibrio entre la vida laboral y personal fueron en su mayoría positivas. Sin embargo, la proporción de enfermeras que percibía positivamente su conciliación laboral y personal (65 %) fue mayor que la proporción que percibió positivamente su horario (59 %). Una prueba de Chi-cuadrado reveló una correlación significativa entre la satisfacción laboral y tres factores: nivel de educación (valor de p 0,008; OR = 1,40), arreglos de horario de turnos (valor de p 0,006; OR = 3,08) y equilibrio trabajo-vida (p -valor 0,016; OR = 2,82).*
Conclusión: *El hallazgo mostró una correlación significativa entre el nivel de educación, el horario de turnos, el equilibrio entre el trabajo y la vida personal y la satisfacción laboral entre las enfermeras. Si no hay un patrón claro para los turnos de trabajo, las enfermeras en las unidades de pacientes hospitalizados experimentarán un mayor estrés laboral y una disminución de la satisfacción laboral. Las organizaciones pueden ayudar a los empleados a mejorar su equilibrio entre el trabajo y la vida mediante la introducción de políticas favorables a la familia, como horarios de trabajo flexibles.*

Palabras clave: *Satisfacción laboral, gestión de enfermería, horario de turnos, equilibrio vida-trabajo.*

INTRODUCTION

Nurse job satisfaction is one known indicator of hospital service quality (1,2). The nurse can be expected to be more productive if they feel satisfied with their jobs and will maintain themselves to keep working (3). Nurses are satisfied when their expectations match the Achievement of their workplace (4). When nurses are satisfied with their job, caring work culture and environment can develop, conducive to better nursing services and patient satisfaction. The research results on Intensive Care Unit (ICU) nurses in China found a relationship between the job satisfaction of ICU nurses and intentions to leave the workplace. The dissatisfaction resulted in them deciding to leave their jobs as ICU nurses (5).

The numerous factors that can improve job satisfaction include challenging work, rewards that meet employees' expectations, a comfortable working environment, and a balance between personal life and work (6). Reducing levels of conflict also increases job satisfaction. As the conflicts that emerge among nurses (mostly women) often originate in the clash between family and work, finding ways to maintain a good work-life balance will positively impact an individual's job satisfaction (7). For that reason, nurse managers need to create programs that address the work-life balance of nurse practitioners. Programs to improve work-life balance were initially implemented to help female employees who were married and had children. It is commonly assumed that men generally experience less work-life conflict than women, as many women combine the roles of employee and housewife, especially in eastern cultures (8).

As nursing services are required 24 hours a day, nurses work in shifts that a nurse manager schedules according to the needs and conditions of the unit or institution. As nursing treatment must maintain its quality and consistency 24 hours a day, appropriate scheduling of shifts is one component of the proper management of nursing resources. While the schedule may

not fully satisfy every staff member, it should at the very least be grounded in the principle of fairness and communicated to all team members. Therefore, nursing managers and administrators must carefully review the current rotating shift system, examine its impact on nurse fatigue, and ensure enough resting time when developing nurse schedules (9).

While previous research on the relationship between work-life balance and organizational commitment has been conducted, for instance, on accountants (10), the relationship between shift schedule arrangement and work-life balance and the ensuing impact on nurses' job satisfaction has rarely been explored especially in Indonesia. Previous studies of the effects of work-life balance and family-friendly programs on job satisfaction at Citarum Hospital, Semarang- Indonesia, found a positive relationship between the two variables among female nurses. Therefore, this study investigated the relationship between work-life balance and job satisfaction. The present research considers shift scheduling as a variable and focuses exclusively on female nurses.

METHODS

Study Design and Sample

This cross-sectional study used a Descriptive correlational research design using one-stage proportionate random sampling. The participants were 100 female nurses drawn proportionately from each West Java hospital in Indonesia. The inclusion criteria were female nurse associates who have been employed for at least one year and follow a shift schedule. The exclusion criteria included nurse managers and associates on leave or study assignments. The sample size calculation was based on Slovin's formula.

Dependent and Independent Variables

The dependent variable included in this study was job satisfaction, categorized as either less satisfied (score≤75 (median)) or satisfied (score>75). The independent variables included work-life balance classified as either negative (score≤46 (median)) or positive (score>46) and shift scheduling categorized as either negative (score≤78 (median)) or positive (score>78).

Instruments

The questionnaires used to collect the data consisted of four questionnaires. Questionnaire 1 related to the characteristics of nurses includes age, gender, education level, years of service, and marital status. Questionnaire 2 about job satisfaction consisted of 29 questions. Questionnaire 3 about setting shift schedules consisted of 29 questions, and questionnaire 4 about work-life balance consisted of 16 questions. Responses were measured on a four-point Likert scale (1=unsatisfied, 2=less satisfied, 3=satisfied, and 4=very satisfied). Total scores were then categorized as either less satisfied (score≤75 (median)) or satisfied (score>75).

The questionnaire used to measure shift schedule consisted of 29 variables related to management, system, and impact of the schedule, which were measured using a four-point Likert scale (1=disagree, 2=slightly disagree, 3=agree, and 4=strongly agree). Total scores were categorized as either negative (score≤78 (median)) or positive (score>78). The work-life balance variable assessed nurses' perceptions of work-life balance and comprised 16 items, using a four-point Likert scale (disagree–strongly agree) and categorized as either negative (score≤46 (median)) or positive (score>46). The three questionnaires have been adapted into Bahasa Indonesia and tested for their validity and reliability; Cronbach's alpha values of 0.70 indicate all are reliable.

Data Analysis

The descriptive analysis was used to describe the frequency of job satisfaction levels. In addition, the Chi-square test was used to describe job satisfaction according to the participant's characteristics.

Ethical Clearance

The study is based on the ethical research principles of self-determination, privacy and

dignity, protection from discomfort and harm, and beneficence and was approved by the Ethics Committee of the Faculty of Nursing of Universitas Indonesia with No.95/UN2.F12.D/HKP.02.04/2017

RESULTS

The average age of participants was 35 years, ranging from 26 to 53 years. The average working period of participants was 10.20 years, ranging from 1.1 years to 18 years. Participants who graduated with a bachelor's degree were greater than those from vocational (60 %), and most (88 %) were married with children (Table 1).

Table 1

Distribution Frequency among female nurses (n = 100)

Characteristic/Variable	Frequency (n)	Percentage (%)
Age		
≤ 35 years old	48	48.00
>35 years old	52	52.00
Working duration		
< 5 years	18	18.00
≥ 5 years	82	82.00
Educational Background		
Vocational	40	40.00
Bachelor/NERS (ref.)	60	60.00
Marital Status		
Married with children	88	88.00
Married, no children	5	5.00
Widow with children	5	5.00
Widow, no children	2	2.00

*Refers to p< 0.05; ref.=reference

A majority (60 %) of the participating female nurses expressed satisfaction with their work, and their perceptions of shift scheduling and work-life balance were mostly positive. However, the proportion of nurses who perceived their work-life balance positively (65 %) was greater than the proportion who perceived their schedule positively (59 %) (Table 2).

Table 2

Frequency distribution of job satisfaction, shift scheduling, and work-life balance among female nurses (n = 100)

Variable	Frequency (n)	Percentage (%)
Job satisfaction		
Satisfied	60	60.00
Less satisfied	40	40.00
Shift Scheduling		
Positive	59	59.00
Negative	41	41.00
Work-Life Balance		
Positive	65	65.00
Negative	35	35.00

Table 3 shows factors associated with job satisfaction. Vocational educational background was a significant factor affecting high job satisfaction with an odds ratio of 1.4 (CI 0.63-3.13). Positive perception of shift scheduling was also found as a significant factor associated with high job satisfaction with an odds ratio of 3.08 (CI 1.58-7.00). Another significant factor associated with high job satisfaction was a positive perception of work-life balance with an odds ratio of 2.82 (CI 1.20-6.63).

DISCUSSION

The current study highlighted the high number of satisfied female nurses. The satisfied bachelor female nurse showed a greater percentage than the vocational nurse. Nurse education is in line with this expectation because of the motivation and support from nursing managers to continue to the next level of higher education. The bachelor nurse showed a forty percent higher likelihood of having satisfied job satisfaction. This finding is in line with the study on Job satisfaction among nurses in Iran, which indicated that most of the nurses had a bachelor's degree, followed by those having a diploma and a master's degree and most of the female nurses had a bachelor's degree (13).

Most of respondents here had a positive perception of shift scheduling, which would be

Table 3

Differences in the level of satisfaction among female nurses based on personal characteristics, shift scheduling, and work-life balance (n = 100)

Characteristics/ Variable	Job Satisfaction				Total	X^2	OR (CI 95 %)	p-value
	Satisfied		Less Satisfied					
	n	%	n	%				
Age								
≤35 years old	33	33.00	20	20.00	53	-	-	0.12
>35 years old	25	25.00	22	22.00	47			
Working duration								
< 5 years	11	11.00	7	7.00	18	-	-	0.57
≥ 5 years	14	14.00	38	38.00	82			
Educational Background						2.32	1.40	0.01*
Vocational	20	20.00	20	20.00	40		(0.63-3.13)	
Bachelor/NERS	35	35.00	25	25.00	60		-	0.61
Marital Status								
Married with children	47	47.00	41	41.00	88	-		
Married, no children	3	3.00	2	2.00	5			
Widow with children	3	3.00	2	2.00	5			
Widow, no children	2	2.00	0	0.00	2			
Shift Scheduling						7.44	3.08	0.01*
Positive	37	37.00	18	18.00	55		(1.58-7.00)	
Negative	18	18.00	27	27.00	45			
Work-Life Balance						7.85	2.82	0.02*
Positive	42	42.00	24	24.00	24		(1.20-6.63)	
Negative	23		23.00	21	21.00	21		

expected to impact their treatment of patients. The head of the room provides policies in preparing the official schedule because he already knows the staff's characteristics and the room's condition. Scheduling should be based on balancing work unit and staff needs—for example, considering which area is busier and which staff needs a break. The method adopted should be appropriate to the quality and quantity of staff in the given unit. All staff members should be involved in the morning to evening shift schedule and participate in full rotations. In addition, longer working hours (i.e., more than 12 hours per shift) have been found to make burnout more likely, in terms of emotional exhaustion, depersonalization, and low personal accomplishment (14). In Europe, a recent study reported that nurses working longer shifts were more likely to experience burnout and job dissatisfaction and intended to leave the job (15). It was observed that non-rotational workers enjoyed more frequent and longer naps and had fewer disturbances in their sleep patterns than rotational workers (16).

Most participants reported positive perceptions of work-life balance—in other words, most female nurses in RS X experience a balance between family and work. This happens because individuals can allocate their time and energy to work and life outside work. This balance is achieved when the individual feels that she can meet the demands of her job without disruption to her needs outside of work and vice versa. However, this perceived equilibrium also affects attitudes, behaviours, and welfare, which affect organizational effectiveness. When employees perceive a lack of equilibrium in their lives because too much of their time is occupied by work, they are driven to consider other jobs that offer them more balance between work and home (17).

The logistic regression analysis showed that education level, shift schedule, and work-life balance significantly affect higher job satisfaction among female nurses. Nurses who are educated bachelors seem more responsive to a problem

and service to patients and career opportunities are getting better. The result observation is that most participants feel satisfied when they get a morning or afternoon shift because nurses still concentrate well in the morning shift. As a result, work can be done well and reduce negligence. In addition, nurses can balance aspects of responsibility towards work and family so that the workload is not felt too heavy, and they are more serious in their work.

An earlier study at an inpatient unit in a hospital in West Java province, Indonesia, revealed a correlation between education and nurse satisfaction ($p = 0.001$) (18), aligning with other evidence that educational background affects the individual's level of job satisfaction (19). These results support the view that a higher education level prompts higher expectations of job satisfaction (20). The data suggested the need for human resource development among the nurses by encouraging the nurses to obtain nurse academic qualifications. In addition, employment policies such as the provision of school tuition should be considered. Nurses are likely to hold their workplace in higher regard if awarded an education grant from the hospital, motivating them to proceed to the NERS level.

A study of the relationship between shift scheduling and employee stress at a private company revealed a strong relationship between shift work and stress (21). In addition, work stress has been found to differ significantly between people on afternoon shifts and those on night shifts and between night and morning shifts, but no difference was found between morning and afternoon shifts (22). Similarly, a study in Central Kerala, India, found that ninety-six percent of nurses experienced stress at work (23,24). Each reacted differently when asked about their shift schedule, with some expressing satisfaction and vice versa. Individuals who work well with minimal error and good teamwork and cooperation also feel more satisfied. Additionally, both job satisfaction and performance have been found to correlate positively with job rotation perception and intention and therefore affect work performance (25).

The finding showed a significant correlation between education level, shift schedule, work-life balance, and job satisfaction among female nurses. This figure suggested that nurses with a higher level of education apply their extensive knowledge and skills to enhance their work, which further increases job satisfaction. Shift scheduling is significantly related to job satisfaction. If there is no clear pattern to work shifts, nurses in inpatient units will experience greater working stress and declining job satisfaction. Work-life balance is significantly related to job satisfaction because nurses habitually show loyalty to the hospital while being committed to their families.

The next need for human resource development among nurses by encouraging nurses to obtain higher academic qualifications. Employment policies such as tuition fees should be considered. Nurses are likely to value their work more if given an educational grant from the hospital, which will motivate them to continue to a higher level. Further research can also examine the effect of other variables that affect the satisfaction of female nurses, such as the reward system and organization.

CONCLUSION

The finding showed a significant correlation between education level, shift schedule, work-life balance, and job satisfaction among female nurses. If there is no clear pattern to work shifts, nurses in inpatient units will experience greater working stress and declining job satisfaction. Organizations can help employees to improve their work-life balance by introducing family-friendly policies such as flexible working hours.

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DISCLAIMER

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CONFLICT OF INTERESTS

None to declare.

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Differences in extraction methods to antidiarrheal activity *in vitro* and *in vivo* in unripe Kayu banana fruit (*Musa paradisiaca L. Var. Kayu*)

Diferencias en los métodos de extracción de la actividad antidiarreica *in vitro* e *in vivo* en frutos de banano inmaduros Kayu (*Musa paradisiaca L. Var. Kayu*)

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SUMMARY

Introduction: *Kayu banana is a fruit found in Lumajang Regency, East Java, with antidiarrheal activity. Phenolic compounds in the unripe Kayu banana fruit have antidiarrheal activity in vivo and in vitro. This study aimed to prove the effectiveness of the extraction method on the phenolic acid content of the unripe Kayu banana fruit (Musa paradisiaca L. var. Kayu) as an antidiarrheal drug and to determine the significant difference between the extraction method on the phenolic acid content and antidiarrheal activity of the unripe Kayu banana fruit (Musa paradisiaca L. var. Kayu).*

Methods: *The research method used is an experimental quantitative method. There are 2 extraction methods used in this study, namely: cold extraction (remaceration and maceration) and hot extraction (reflux and Soxhlet).*

Results: *The results obtained in the extraction method with the remaceration extraction method were 99.31±1.11 mg GAE/g, with the highest antidiarrheal activity at the average marker trajectory. The Soxhlet extraction method has the highest antibacterial activity with an average inhibition zone of 24 0.82 mm.*

Conclusion: *Differences in extraction methods affect the phenolic levels of the extract and the antidiarrheal activity in vitro and in vivo in the raw fruit extract of banana wood. Based on the percentage of inhibition produced by the extract of the unripe fruit of the wood banana (Musa paradisiaca L. Var. Kayu), the extraction method of remacetation was 55.82 %, with the highest phenolic content. The soxhlet method has the highest antidiarrheal activity.*

Keywords: *Extraction methods, antidiarrheal, Musa paradisiaca L. Var. Kayu*

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RESUMEN

Introducción: El banano Kayu es una fruta que se encuentra en Lumajang Regency, East Java, con actividad antidiarreica. Los compuestos fenólicos en la fruta de banano Kayu verde tienen actividad antidiarreica in vivo e in vitro. Este estudio tuvo como objetivo probar la efectividad del método de extracción sobre el contenido de ácido fenólico de la fruta de banano Kayu inmaduro (Musa paradisiaca L. var. kayu) como fármaco antidiarreico y determinar la diferencia significativa entre el método de extracción sobre el contenido de ácido fenólico y actividad antidiarreica de la fruta de banano Kayu inmadura (Musa paradisiaca L. var. kayu).
Métodos: El método de investigación utilizado es un método cuantitativo experimental. Hay 2 métodos de extracción utilizados en este estudio, a saber: extracción en frío (remaceración y maceración) y extracción en caliente (reflujo y Soxhlet).
Resultados: Los resultados obtenidos en el método de extracción con el método de extracción por remaceración fueron de 99,31±1,11 mg GAE/g, con la mayor actividad antidiarreica en la trayectoria promedio del marcador. El método de extracción Soxhlet tiene la actividad antibacteriana más alta con una zona de inhibición promedio de 24 0,82 mm.
Conclusión: Las diferencias en los métodos de extracción afectan los niveles fenólicos del extracto y la actividad antidiarreica in vitro e in vivo en el extracto de fruta cruda de madera de banano. Con base en el porcentaje de inhibición que produce el extracto del fruto inmaduro del banano de madera (Musa paradisiaca L. Var. Kayu), el método de extracción de remacetación fue de 55.82 %, con el mayor contenido fenólico. El método Soxhlet tiene la mayor actividad antidiarreica.

Palabras clave: *Métodos de extracción, antidiarreico, Musa paradisiaca L. Var. kayu*

INTRODUCTION

The unripe fruit of the Kayu banana (*Musa paradisiaca L. var. Kayu*) is a medicine that is often used empirically by the people of Senduro village, Lumajang, East Java, to treat diarrhea. Empirically, the use of unripe Kayu banana fruit (*Musa paradisiaca L. var. Kayu*) in Senduro is used by burning, steaming, and boiling. In a previous study, bananas also had an antidiarrheal effect in rats induced by oleum ricini showed that the phytochemical test results of the ethanol extract of unripe Kayu banana fruit (*Musa paradisiaca L. var. Kayu*) showed positive tannin content which had antidiarrheal activity induced by Oleum Ricini at a dose of 100 mg/kg, b.w. (1/3) unripe wooden banana has been used empirically as an antidiarrheal by the people in Senduro village, Lumajang, East Java. The study aimed to prove the antidiarrheal effect of ethanol extract of unripe wooden banana (*Musa paradisiaca L.*).

The active compounds contained in unripe Kayu banana fruit are tannins, flavonoids, alkaloids, and saponins (4-7). These compounds have pharmacological activity as antibacterial. To get the active compound it is necessary to do an extraction. The extraction method used can affect the concentration or loss of the therapeutic effect of Simplicia because some Simplicia is relatively stable and can be decomposed depending on the extraction method used (8,9).

Techniques for obtaining phenolic compounds can use several cold and hot extraction methods. The cold extraction method uses remaceration and maceration extraction, while the hot extraction method uses Soxhlet and reflux extraction methods. Several large industries have long applied continuous filtration so that it is time efficient, solvent savings, and the more unripe material is extracted (10). Based on the above background, a study was conducted on the antidiarrheal activity of the unripe fruit extract of the unripe Kayu banana fruit (*Musa paradisiaca L. var. Kayu*) with several extraction methods.

MATERIALS AND METHODS

Materials

The tools used in this research are a hotplate, oven, filter paper, Bunsen, Buchner funnel, macerator, rotary evaporator, Soxhlet, reflux, percolation, Uv-Vis spectrophotometry, analytical balance, surgical table and surgical instruments, Petri dish, incubator, oven, bunsen, autoclave, water bath, paper disk. The materials used in this study were unripe Kayu banana fruit (*Musa paradisiaca L. var. Kayu*), 96 % ethanol, sterile distilled water, Mayer reagent, Dragendoorf reagent, 2 M HCl, magnesium, concentrated HCl,

$FeCl_3$, CH_3COOH, H_2SO_4, acid error, and Folin Ciocalteau reagent, Na_2CO_3, Oleum ricini, CMC-Na, loperamide HCl, Chinese ink, *Escherichia coli* bacteria, MHA (Muller Hinton Agar) media, 70 % alcohol, chloramphenicol, $BaCl_2$ solution, H_2SO_4 solution, NaCl 0.9 %.

Stage of Study

1. Plant Determination

Determination of unripe Kayu bananas was carried out at Purwodadi Pasuruan Botanical Gardens (LIPI) and the Food Security and Agriculture Office of Lumajang Regency. This determination was made to ensure the correctness of the plants used in the study.

2. Making Simplicia Raw Fruit Banana Kayu (*Musa paradisiaca L. var. kayu*)

A total of 12 959.9 g of unripe Kayu banana fruit were washed under running water until clean, drained, and weighed wet. Then cut, dried in a drying rack at a temperature of 50ºC, sorted dry, and weighed dry. The dry samples were then blended, sieved, and stored in plastic containers (11).

3. Microscopic Examination

Microscopic examination was carried out by performing some Simplicia powder on a glass object that had been dripped with chloral hydrate solution, covered with a cover slip, and viewed under a microscope.

4. Sample Extraction

a. Remaceration

A total of 500 g of Simplicia powder of unripe Kayu banana fruit (*Musa paradisiaca L. var. Kayu*) was macerated using 96 % ethanol solvent at room temperature and stirred. The powder is soaked for 24 h. Remaceration was carried out 2 times and filtered to separate the residue and filtrate. The resulting macerate was then evaporated with a rotary evaporator at a temperature of 50ºC and evaporated until it became a thick extract (12).

b. Maceration

An amount of 500 g of Simplicia powder of unripe Kayu banana fruit was added to as much as 3 750 mL of 96 % ethanol solvent and maceration. After all the powder is soaked, stirred slowly, and soaked for 5 days with stirring. The resulting macerate was then evaporated using a rotary evaporator at a temperature of 50ºC (13).

c. Soxhlet

A total of 500 g of Simplicia powder was wrapped in filter paper, tied, and then put into a Soxhlet extractor. 1.5 L of 96 % ethanol solvent was put into a round bottom flask. Then the Soxhlet device was assembled with a condenser. Extraction was carried out at a temperature of 60-80ºC until the liquid was colorless. The extract obtained was evaporated using a rotary evaporator at a temperature of 50ºC (14).

d. Reflux

A total of 500 g of Simplicia powder was put into a round bottom flask, and then 96 % ethanol solvent was added. Assemble the reflux device, and the sample was extracted at 50ºC for 2 hours. The solution was filtered using filter paper and evaporated using a rotary evaporator at a temperature of 50ºC (12).

5. Phytochemical Screening

Alkaloid Test: The filtrate was divided into 3 parts, each added with Mayer, Dragendorf, and Wagner reagents. The positive results for alkaloids are that Mayer formed white or yellow on the surface, Wagner on the brown surface, and Dragendorf on the brown surface (15).

Saponin Test: A total of 0.5 g of powder was put into a test tube, added to 10 mL of hot air,

and then shaken for 10 seconds. If it is formed as high as 1 minute to 10 cm, which is stable, it indicates the presence of saponins (16).

Flavonoid Test: 5 mL of the filtrate was added with 0.1 g of Mg powder, 2 mL of amyl alcohol, and 1 mL Dragendoorf reagent of concentrated hydrochloric acid, shaken and allowed to separate. The red, yellow, or orange colors formed on the amyl alcohol layer indicate a positive presence of flavonoids (17).

Tannin Test: 2 mL was taken and added with 1 to 2 drops of 1 % $FeCl_3$. Changes in color to green, blue or blackish indicate a positive result for tannins (18).

Polyphenol Test: The filtrate was divided into 3 parts (A, B, and C). Filtrate A was used as a blank, filtrate B was added with 3 drops of $FeCl_3$, and filtrate C was added with gelatin salt. The color change from green to blue-black indicates the presence of phenolic compounds (19).

Triterpenoid and Steroid Test: As much as 0.1 g of extract was added 3 drops of concentrated HCl and 1 drop of H_2SO_4. If red or purple color is formed, it is positive that it contains terpenoids. If green color is formed, it is positive that it contains steroids (20).

Anthraquinone Test: A total of 0.3 g of the extract was extracted with 10 mL of distilled water, then the filtrate was extracted with 3 mL of toluene and added with ammonia. There is a color change to red which indicates positive anthraquinone.

Glycoside Test: 1 g of thick extract was dissolved in ethanol, evaporated over a water bath, then dissolved in 5 mL of anhydrous acetic acid P. and added 10 drops of sulfuric acid Blue or green color formed indicates the presence of glycosides (21).

6. Determination of the content of phenolic compounds

a. Preparation of concentration test solution

Weighed 10 mg of ethanol extract from raw wood banana fruit, then put it into a 10 mL volumetric flask. The volume was filled with methanol p.a to the limit mark (22).

b. Preparation of gallic acid solution

Gallic acid solution was prepared with a concentration of 1 000 ppm. We weighed as much as 10 mg of gallic acid and then dissolved it in 10 mL of methanol pro analysis (22).

c. Determination of the maximum absorption wavelength

Take 3 mL of solution with a concentration of 30 ppm, add 0.4 mL of Folin-Ciocalteau reagent, shake it and leave it for 4-8 minutes, add 4.0 mL of 7 % Na_2CO_3 solution, and shake until homogeneous. Added bi-distilled water up to 10 mL and allowed to stand for 2 hours at room temperature. The absorbance was measured at a maximum wavelength of 600 – 1 100 nm. A calibration curve was made for the relationship between gallic acid concentration (μg/mL) and absorbance (22).

d. Gallic acid standard curve measurement

For each concentration of 10, 20, 30, 40, and 50 ppm. Take 0.1 mL, add 0.4 mL of Folin-Ciocalteau reagent, shake, and leave for 4-8 minutes. Add 4.0 mL of 7 % Na_2CO_3 solution and shake until homogeneous. Added distilled water up to 10 mL and allowed to stand for 2 hours at room temperature. The absorbance was measured at a maximum wavelength of 759 nm. A calibration curve was made for the relationship between gallic acid concentration (μg/mL) and absorbance (22).

e. Determination of the total phenolic content of raw wood banana extract (*Musa paradisiaca L. Var. Kayu*)

The extract solution was pipetted as much as 1 mL of unripe Kayu banana fruit extract. The sample was added with 0.4 mL of Folin-Ciocalteau reagent, shaken, and left for 4-8 minutes, adding 4.0 mL of 7 % Na_2CO_3 solution until homogeneous. Add bi-distilled water to 10 mL and let stand for 2 hours at room temperature. Measure the absorption at the maximum absorption wavelength of 744.8 nm. Perform

3 repetitions to obtain the phenol content as mg gallic acid equivalent/g extract (22).

7. Antibacterial Activity Test

a. Tool Sterilization and Production of Mueller Hinton Agar (MHA) Media

The tools and materials used are first sterilized in an autoclave at 121ºC for 15 minutes at a pressure of 2 Atm. Tools such as ose and tweezers were sterilized by immersing them in 70 % alcohol for 5 minutes, then ignited with a Bunsen flame (23). A total of 3.42 g of MHA media were suspended in 90 mL of sterile distilled water and then heated to boiling. The fully suspended media was sterilized in an autoclave at 121ºC for 15 min (24,25).

d. Bacterial Rejuvenation Process

The test bacteria were grown on a slanted agar medium by taking a pure bacterial loop with a needle and scraping it aseptically in a Laminar Air Flow (LAF) cabinet. Then incubated at 37ºC for 24 h.

e. Preparation of Standard Turbidity Solution (Mc. Farland's Solution)

Mc. Farland's standard solution was made by taking 0.05 mL of $BaCl_2$ solution and 9.95 mL of H_2SO_4 solution and then shaking them until a cloudy solution was formed. This turbidity was used as a standard for the turbidity of the bacterial test suspension (25).

f. Preparation of *Escherichia coli.* Bacterial Suspension

The *Escherichia coli* test colonies were suspended by taking one ose of colonies from the rejuvenation medium, then suspended into a test tube containing 2 mL of 0.9 % NaCl solution until the turbidity was the same as the turbidity standard of Mc. Farland's solution (24).

g. Negative Control Creation

A total of 5 mL of DMSO solution was diluted with distilled water to 100 mL.

h. Positive Control Creation

Weighed 0.0015 g of chloramphenicol, put the powder into a beaker glass, added sterile distilled water a little while stirring until homogeneous, and then diluted with sterile distilled water to 10 mL.

i. Preparation of Motherboard Test Solution for Banana Wood Fruit Ethanol Extract

The test solution was made by dissolving the ethanolic extract of unripe Kayu banana with 5 % DMSO solution by weighing 10 g of extract, adding 5 % DMSO solution little by little, stirring until homogeneous, and then diluting with 5 % DMSO solution to 10 mL.

j. Determination of Antibacterial Activity of Banana Kayu

Unripe Kayu banana fruit extract prepares sterilized Petri dishes. Then 15 mL of MHA medium was poured into each Petri dish, then 1 mL of bacterial suspension was inoculated on the media and allowed to solidify. The paper disc is immersed in the sample to be tested, and then the paper disc is placed on an agar plate, then incubated at 37ºC for 24 h. Then the diameter of the inhibition zone (mm) was measured for each sample (20).

8. Antidiarrheal Activity Test

a. Preparation of CMC-Na 0.5 % w/v and Loperamide HCl Suspension 0.02 % w/v and 0.01 % w/v

A total of 0.5 g of CMC Na was sprinkled into a mortar containing 20 mL of hot distilled

water, covered, and left for 30 minutes until a transparent mass was obtained, crushed, and then diluted with distilled water to 100 mL (15). Lodia tablets contain 2 mg of Loperamide HCl; 10 tablets were taken for Lopramid HCl content of 0.02 % w/v. The tablets were ground until homogeneous. The powder was put into a mortar, and then 0.5 % CMC-Na suspension was added little by little the chili was ground homogeneously and then diluted with 0.5 % CMC-Na suspension to 100 mL (4).

c. Preparation of Unripe Kayu Banana (*Musa Paradisiaca L. var. Kayu*) Ethanol Extract Suspension

Testing the antidiarrheal effect of the unripe Kayu banana fruit extract suspension included the antimotility activity test (inhibiting intestinal movement so that the frequency of diarrhea was reduced), ethanol extract of the unripe Kayu banana fruit with the intestinal transit method (comparing the length of the intestine through the marker to the overall length of the intestine). Mice were randomly grouped into six groups, each consisting of five mice, and then weighed each mouse. 1) Negative control group (Given CMC-Na 0.5 % 0.2 mL/20 g, b.w. orally and given 1 mL Chinese ink). 2) Positive control group (Given HCl suspension 0.02 % w/v at a dose of 2 mg/kg as much as 0.2 mL/20 g, b.w. and given 1 mL Chinese ink). 3) Test Group (Given the suspension of unripe Kayu banana fruit ethanol extract 2 % w/v with a dose of 200 mg/kg, b.w. on remaceration, percolation, reflux, and Soxhlet methods.

Ethanol extract from unripe Kayu banana fruit and loperamide was given at the beginning of the experiment. One hour after treatment, all rats were given 2 mL of oleum ricini. After 1 hour of administration of oleum ricini, 1 mL of Chinese ink was given orally to mice. After an hour of giving the Chinese ink, all the animals were sacrificed by dislocation of the cervical spine. Next, animals are dissected, and their intestines are carefully removed. The length of the intestine traversed by the Chinese ink marker was measured from the pylorus to the ileocecal valve of each animal, and then each animal has calculated the percent of the path traversed by the Chinese ink marker to the total length of the intestine (15).

Data analysis

In this study, for data analysis using SPSS calculations do normality testing before proceeding to the next test. When the results show normal, you can continue the parametric test, but nonparametric testing will be carried out if the data is not normal. For this study, a follow-up test was carried out using homogeneity testing, One way ANOVA, and Tukey test. In addition, an ethical feasibility test has been carried out with the number 170/HRECC.FODM/IV/2022.

RESULTS

Plant Determination

Sampling was carried out in Lumajang Regency, East Java. The selection of fruit taken is a fruit that is still fresh and unripe with a green color without a yellow color, hard, and 3 months old after the flower bunches come out. The unripe Kayu banana fruit that has been obtained is then determined to ensure the correctness of the plants used in the study. Determination of Kayu banana raw fruit was carried out at Purwodadi Pasuruan Botanical Gardens (LIPI), and wooden banana raw fruit was indeed a woody variety by proving the determination of wooden banana raw fruit at the Lumajang Regency Food and Agriculture Security Service.

Sample Making

The unripe Kayu banana fruit, as much as 12 959.9 g, was washed with running water to remove dirt and sap that was still attached to the unripe Kayu banana fruit. Unripe Kayu banana fruit that has been washed is then dried by aerating, then the wooden bananas are cut into thin strips to facilitate a drying process. Drying was carried out using a food dehydrator oven at a temperature of 50º and obtained dry Simplicia results. The dried Simplicia was then mashed using a blender until it became powder, and the resulting fine powder was 4 152.6 g.

Table 1

Results of Simplicia Characteristics of Unripe Kayu Banana Fruit Powder

Simplicia	Temperature	Weight of fresh Simplicia (g)	Weight of dry Simplicia (g)	% Drying shrinkage	Water rate	Organoleptic
Kayu Banan unripe fruit	Temperature 50ºC	12 959.9 g	4152.6 g	32.04 %	2.74 %	Aromatic characteristic smell, ivory color, and in white powder form

Microscopic Examination

The results of the research on raw wood banana fruit powder showed that unripe Kayu banana fruit powder with observations under a microscope found fragments or parts contained in the unripe Kayu banana fruit including the trachea, oily glands, starch, and fibers.

Extract Manufacture

Simplicia extraction uses 2 extraction methods, namely cold and hot methods. Cold extraction methods use remaceration and maceration while hot extraction methods use reflux, and Soxhlet uses 96 % ethanol solvent with a temperature of 50ºC according to the results of Table 4.1 % the highest yield using the remaceration extraction method with 16.45 % yield.

Table 2

Result RendeMen of Kayu Banana Unripe Fruit Extract

No	Extraction Method	Powder Weight	Extract Weight	Rendemen Extract (%)	Organoleptic Extract
1	Remaserasi	750 g	123.4 g	16.45	Color: brownish green Smell: slightly pungent Taste: slightly bitter and astringent
2	Maserasi	750 g	106.3 g	14.17	Color: brownish green Smell: slightly pungent Taste: slightly astringent and very bitter
3	Reflux	750 g	85.7 g	11.42	Color: dark green Smell: slightly pungent Taste: slightly bitter and slightly astringent
4	Soxhlet	750 g	76.8 g	10.24	Color: dark green Smell: very pungent Taste: bitter

Phytochemical Screening Examination

Phytochemical screening was conducted to determine the content of secondary metabolites in the unripe Kayu banana fruit extract. The phytochemical screening included tannins, alkaloids, saponins, flavonoids, polyphenols, glycosides, anthraquinones, terpenoids, and steroids. Based on the results of the phytochemical screening test with remaceration

and maceration extraction methods, it produced significant secondary metabolite compounds containing alkaloids, saponins, flavonoids, tannins, polyphenols, and anthraquinones. While the reflux and Soxhlet extraction method produces secondary metabolites containing alkaloids, saponins, flavonoids, tannins, polyphenols, anthraquinones, and triterpenoids. In this study, the results of phytochemical screening produced different secondary metabolites because time and temperature greatly affected the number of compounds extracted, so the extraction method by heating where the extraction method would provide an opportunity to obtain maximum secondary metabolites.

Table 3
Results of Phytochemical Screening of Unripe Kayu Banana Fruit

Organoleptic Examination	Extraction Method			
	Remaceration	Maceration	Reflux	Soxhlet
Alkaloid	+	+	+	+
Saponin	+	+	+	+
Flavonoid	+	+	+	+
Tannin	+	+	+	+
Polyphenol	+	+	+	+
Anthraquinone	+	+	+	+
Glycoside	-	-	-	-
Steroid	-	-	-	-
Triterpenoid	-	-	+	+

Antibacterial Activity Test

The method used in the antibacterial activity test is the disc diffusion method. The results of the antibacterial test were based on the measurement of the diameter of the zone of inhibition of bacterial growth formed around the paper disc. The bacteria used were *Escherichia coli* bacteria with Muller Hinton Agar (MHA) media.

Based on the study's results, it was shown that the unripe Kayu banana fruit extract with different extraction methods at a concentration of 100 % had a very strong inhibitory power against the test bacteria. The positive control was categorized as very strong inhibitory, while the negative control did not show any inhibition against the test bacteria. The positive control used was chloramphenicol at a dose of 150 μg. The reason for using chloramphenicol as a positive control was because chloramphenicol is a broad-spectrum antibiotic capable of treating infections caused by gram-positive and gram-negative bacteria. The highest average inhibition zone was the Soxhlet extraction method with an inhibition zone diameter of 24 mm. Next, the remaceration extraction method with an inhibition zone diameter of 23.25 mm, then the reflux extraction method with an average inhibition zone diameter of 23 mm, and the lowest is the maceration method with an average inhibition zone diameter of 20.5 mm.

***In vivo* Antidiarrheal Activity Testing**

The method used in the test of antidiarrheal activity is the intestinal transit method. The results of the antidiarrheal activity test are based on the effect of the ratio of the distance of the intestine traveled by the marker at a certain time to the overall intestinal length in mice or rats.

Based on the results of the study, it can be seen that the different extraction methods can affect the antidiarrheal activity of the unripe Kayu banana fruit extract. The extract using the CMC-Na extraction method (Negative Control) had the highest average cross-marker length in the intestines of mice, which was 78 %. On the other hand, the extract using the Loperamide HCl extraction method (Positive Control) had the lowest average cross-marker length in the intestines of mice, which was 32 %.

Table 4

Results of Inhibitory Zone Diameter for Antibacterial Activity Test

Sample Group	Concentration	Replication	Inhibition Zone	Average	SD	Inhibition Zone ± SD	Interpretation
Chloramphenicol	150 μg	1	27	29.75	2.63	29.75 ± 2,63	Susceptible
		2	28				
		3	32				
		4	32				
DMSO	5 %	1	0	0	0	0 ± 0	No Inhibition
		2	0				
		3	0				
		4	0				
Remaceration	100 %	1	24	23.25	1.5	23.25 ± 1.5	Susceptible
		2	22				
		3	25				
		4	22				
Maceration	100 %	1	22	20.5	1	20.5 ± 1	Susceptible
		2	20				
		3	20				
		4	20				
Soxhlet	100 %	1	25	24	0.82	24 ± 0.82	Susceptible
		2	24				
		3	23				
		4	24				
Reflux	100 %	1	23	23	0.82	23 ± 0,82	Susceptible
		2	23				
		3	22				
		4	24				

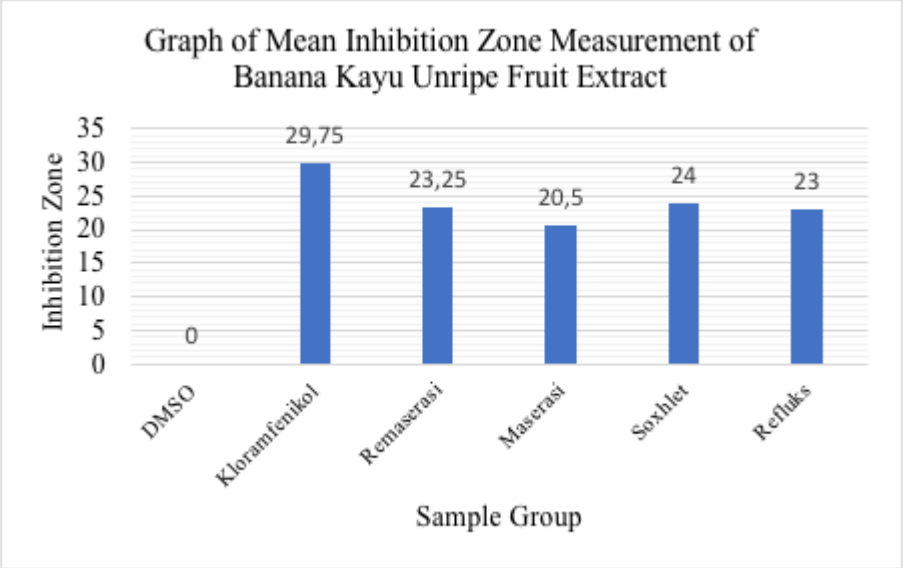

Figure 1. Graph of Average Inhibition Zone Measurement of Raw Fruit Extract.

Table 5
Results of Cross Marker Length Test in Intestines of Mice

Test Material	Replication	Intestine Length (CM)	Ink Distance (CM)	Cross-Ratio Markers	(%) inhibition	Standard Deviation
Loperamide HCL	2	53	20	0.3773	58.38	0.0920
	3	55	19.5	0.3545		
	4	55	21	0.3818		
	5	53	10	0.1886		
		Average		0.3256		
CMC-Na	1	52	39	0.75	0	0.0954
	2	52	45	0.8653		
	3	53	45	0.8490		
	4	50	33	0.66		
		Average		0.7811		
Remaceration	2	55	22	0.4	55.77	0.1100
	3	55	15	0.2727		
	4	55	26	0.4727		
	5	55	13	0.2363		
		Average		0.3454		
Maceration	1	52	24	0.4615	42.86	0.0646
	2	50	26	0.52		
	3	50	22	0.44		
	5	55	20	0.3636		
		Average		0.4462		
Reflux	2	55	30	0.5454	45.06	0.0916
	3	56	24	0.4285		
	4	56	18	0.3214		
	5	57	24	0.4210		
		Average		0.4291		
Soxlhet	2	53	25	0.4716	30.81	0.0527
	3	57	30	0.5263		
	4	55	32	0.5818		
	5	55	32	0.5818		
		Average		0.5404		

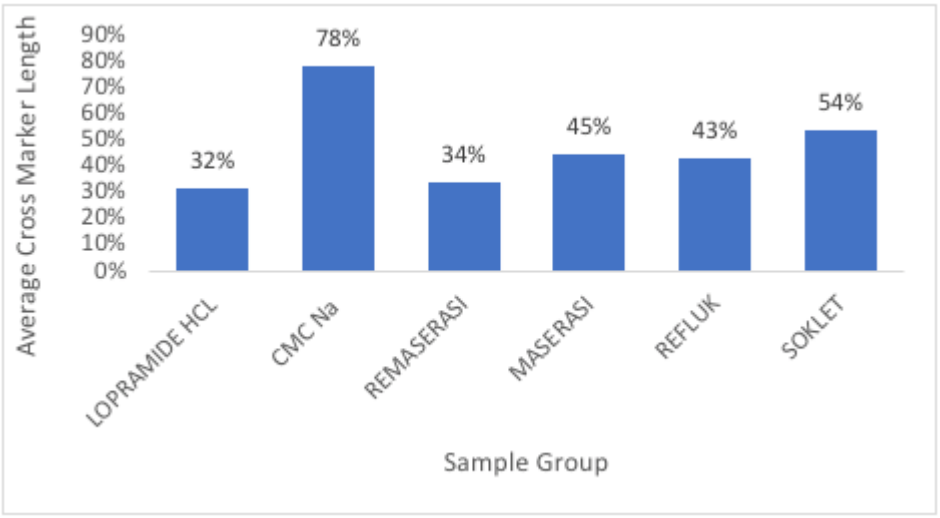

Figure 2. The results of the average length of cross markers in the intestines of mice.

DISCUSSION

In this study, the extract yield from the remaseration extraction method was 16.45 %, and for the results of obtaining phenolic compound, levels produced 99.31±1.11 mg GAE/g, the result of the maceration extract yielded was 14.17 % and for the results of obtaining phenolic compound levels produced by 53.96±0.81 mgGAE/g. In previous research, differences in pomegranate extraction methods show differences in anthocyanin levels (26). The difference in amendments and phenolic levels obtained is suspected to be because the remaceration method is carried out at room temperature and protected from sunlight and heat, the withdrawal of active compounds for 2 days is carried out by soaking the Simplicia powder with the appropriate solvent for 2 days and changing the solvent every day. When it reaches the equilibrium phase, the plant cell will be entered by the solvent by passing through the cell wall. The equilibrium process occurs by exiting secondary metabolite compounds inside the cell because the concentration inside the cell is different from the concentration outside the cell. The equilibrium process occurs because there is a diffusion process caused by a difference in concentration. A higher concentration inside the cell will cause the secondary metabolite compounds to come out and be replaced by solvent liquid outside the cell whose concentration is lower. The event repeatedly occurs until there is a balance of concentration outside and inside the cell. During the remaseration process, a replacement of the igniting fluid is carried out every day for 2 days to maximize the effectiveness of withdrawal. In the maceration extraction method, there is no repetition of the addition of solvents so that the active compounds contained in the raw fruit of wood bananas are not attracted to the maximum. Therefore, the levels of phenolic compounds produced are low.

The result of the reflux method extract yield was 11.42 %, and the resulting phenolic content was 54.65±0.80 mg GAE/g. In the Soxhlet method, an extract yield of 10.24 % was obtained, and the resulting phenolic compound content was 54.47±0.65 mg GAE/g. The reflux method is a method of extraction with the help of heating. The addition of heating greatly affects extraction using reflux, and the solvent used will remain fresh due to the submerged re-evaporation in the material. Therefore, reflux extraction extracts heat-resistant materials with a rough texture (22). The principle of the Soxhlet method is that it is carried out continuously using relatively few solvents. When the extraction is complete, the solvent can be evaporated to obtain an extract. Usually, the solvent used is volatile or has a low boiling point (10). Hmidani et al. 2019 revealed that all extracts obtained from various extraction methods of *Thymus atlanticus* showed different phenolic concentrations, and the extraction time used in the extraction also affected the acquisition of phenolic levels (27).

In the reflux method, the level of phenolic compounds that are high enough should produce high yield levels, but the time made for extraction is quite short, namely for 2 hours, so that the withdrawal process of secondary metabolite compounds is not attracted to the maximum, but the levels of phenolic compounds produced are quite high due to the heating process, causing the cell wall of wood banana fruit powder to open larger, in addition, the heating process also results in the viscosity of the solvent decreasing so that the ability of the solvent to penetrate the cell wall becomes easier and the amount of phenolic compounds extracted becomes high. In the Soxhlet extraction method, the extraction process is quite long, which is 5 hours, so the time in the extraction process greatly affects the optimal extraction time. However, if the extraction time is too long, it will damage the active compounds, and if the extraction time is too short, it will result in low extract yield levels. The results of high phenolic compounds are suspected to be caused by the heating process so that the cell walls of banana powder can break and can secrete active compounds that can withstand heating.

The remaceration method is a modified method of the maceration method where the remaceration method is carried out by repeatedly adding solvent after the first extract has been filtered. In this study, the extract yield from the remaceration extraction method was 16.45 %, and the phenolic compounds yielded 99.31±1.11 mg GAE/g, allegedly producing the highest yield and phenolic compounds because at room temperature and protected from sunlight and heat, the extraction was carried out. The active compound was for 2 days by soaking the

Simplicia powder with the appropriate solvent for 2 days and changing the solvent every day. When it reaches the equilibrium phase, the plant cell will be penetrated by the solvent by passing through the cell wall. The equilibrium process occurs through the release of secondary metabolites in the cell because the concentration inside the cell is different from the concentration outside the cell. This equilibrium process occurs because there is a diffusion process caused by a difference in concentration where a higher concentration inside the cell will cause secondary metabolites to come out and be replaced by a lower concentration of solvent outside the cell. These events occur repeatedly until there is a balance of concentration outside and inside the cell. During the remaceration process, the filtered fluid is replaced every day for 2 days so that the effectiveness of the withdrawal will be maximized.

The maceration method is a cold extraction method and the simplest method in which the liquid filter will penetrate the plant cell wall and will enter the cell cavity containing the active substance so that the active substance, which is the concentrated solution, will be forced out of the cell due to the difference in concentration between the solute solution. Active inside the cell with those outside the cell (28). The yield of the resulting extract was 14.17 %, and the yield of phenolic compounds was 53.96±0.81 mg GAE/g. High yield results due to the long enough time and stirring many times. Therefore, the compounds contained in the raw fruit of the wooden banana are attracted quite a lot. The yield is high enough so that the levels of phenolic compounds should be high, but the principle of the maceration extraction method is not to repeat the addition of solvents so that the active compounds contained in the unripe fruit of Kayu bananas are not maximally attracted. Therefore, the levels of phenolic compounds produced are low.

The reflux method is an extraction method with the help of heating. The addition of heating greatly affects the extraction using reflux, and the solvent used will remain in a fresh state because of the re-evaporation that is submerged in the material. Reflux extraction extracts heat-resistant and coarse-textured materials (22). The extract yield was 11.42 %, and the phenolic content produced was 54.65±0.80 mg GAE/g. High levels of phenolic compounds should produce high yields, but the extraction time is quite short, namely for 2 hours, so the secondary metabolite withdrawal process is not maximally attracted, but the levels of phenolic compounds produced are quite high due to the heating process, causing the cell walls of the wood banana fruit powder. The opening is larger; besides that, the heating process also causes the solvent's viscosity to decrease so that the solvent's ability to penetrate the cell wall becomes easier, and the amount of phenolic compounds extracted is high. Soxhlet extraction time will affect the attraction of chemical compounds. The Soxhlet method takes a long time for extraction, so the Soxhlet method can draw more leverage than the reflux method. The remaceration method has a higher average diameter of the inhibition zone than the reflux method, and it is possible that in this reflux method, several chemical compounds function as an antibacterial that has lower levels than the remaceration method. Hence, the remaceration method has a higher average inhibition zone than the reflux method.

Based on the results of phytochemical screening, the extract using the positive heat extraction method contains triterpenoid compounds while the cold method does not contain triterpenoid compounds, where these triterpenoid compounds have antidiarrheal activity so that the extract using the Soxhlet extraction method provides higher antidiarrheal activity than the maceration method. The reflux method has a lower average cross-marker length in the intestines of mice than the Soxhlet method. The extraction time will affect the attraction of chemical compounds. The Soxhlet method takes a long time for extraction, so the Soxhlet method can draw more leverage than the reflux method. The remaceration method has a higher average cross-marker length in the intestines of mice than the reflux method, and it is possible that in this reflux method, several chemical compounds function as antidiarrheals that have lower levels than the remaceration method, so the remaceration method has an average cross-marker length in mice. Mice intestine is higher than the reflux method.

Based on the results of the one-way ANOVA test on phenolic content testing, it can be concluded that the results of hypothesis testing

have significant performance differences between the extraction methods. This result is indicated by the Fable value of 2.8951073, and the probability value (sig) of 0.000 H0 is rejected, where Fount Fable and the probability (sig) 0.05. The Fount value from the ANOVA Table is 3404,728, and the Fable value is 2.8951073, so it is 3404,728 2.8951073, and the probability value (sig) in the ANOVA Table is 0.0001 while the significance level = 0.05 so 0.0001≤0.05. Therefore, it can be concluded that there is a significant difference in the results of the phenolic compound levels. The analysis of the inhibition zone data and the average cross-marker length was continued using nonparametric analysis with the Kruskal-Wally's test aimed at seeing the difference in the diameter of the inhibition zone between the different extraction methods, positive control, and negative control. Based on the results of the Mann-Whitney Test, it was shown that the difference in the extraction method was statistically significant between the positive and negative controls. The negative control and the different extraction methods had a significant difference in terms of inhibitory activity because the negative control did not produce bacterial inhibitory activity and antidiarrheal activity.

CONCLUSION

Based on the results of the research that has been carried out, it can be concluded that differences in extraction methods affect the phenolic content of the extract and the antidiarrheal activity in vitro and in vivo in the extract of the unripe Kayu banana fruit. So it can be concluded that the ethanolic extract of the unripe Kayu banana fruit (*Musa paradisiaca L.Var.Kayu)* raw fruit has activity as an antidiarrheal *in vitro* and *in vivo*. Based on the percentage of inhibition produced by the unripe fruit extract of wood banana (*Musa paradisiaca L. Var. Kayu),* the remaceration extraction method was 55.82 %, with the highest phenolic content. The Soxhlet method has the highest antidiarrheal activity.

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ARTÍCULO ORIGINAL

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Relationship between cholesterol levels and smoking behavior among active smokers

Relación entre los niveles de colesterol y el comportamiento de fumar entre los fumadores activos

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SUMMARY

Introduction: *Smoking behaviour is one of the factors that can cause serious and deadly diseases. Cigarette chemical content can reduce High-Density Lipoprotein (HDL) levels and increase Low-Density Lipoprotein (LDL) levels. It can cause fat metabolism disorders and are at risk for heart disease, cancer, and others. This study aimed to determine the relationship between cholesterol and smoking behaviour among active smokers.*
Methods: *This research is a cross-sectional research design. A sample of as many as 30 people was taken using a purposive sampling technique according to the inclusion and exclusion criteria that have been determined. The analytical method used is cross tabulation analysis and Spearman correlation analysis. The data used are total cholesterol level and smoking behaviour measured using the Brinkman index.*
Results: *The results of the analysis showed that there was an increase in cholesterol levels among active smokers with increasing age. This is due to an increase in the number of cigarettes consumed every day. Cholesterol levels have a positive correlation of 0.386 with smoking behavior as measured by the Brinkman Index. This means that an increase in smoking behavior will be followed by an increase in cholesterol levels. The resulting significance value is 0.035 (P <0.05), which means that there is a significant relationship between cholesterol levels and smoking behavior.*
Conclusion: *Smoking is a bad habit that greatly affects total cholesterol levels in the blood. This habit should be avoided to reduce the factors that cause increased cholesterol levels in the blood that can trigger diseases such as cancer, heart disease, and the risk of death. Smokers with high smoking intensity tend to have higher total cholesterol levels.*

Keywords: *Active smokers, Brinkman Index, cholesterol, smoking behavior.*

RESUMEN

Introducción: *El tabaquismo es uno de los factores que pueden causar enfermedades graves y mortales. El contenido químico del cigarrillo puede reducir los niveles de lipoproteína de alta densidad (HDL) y aumentar los niveles de lipoproteína de baja densidad (LDL). Puede causar trastornos del metabolismo de las grasas y se corre el riesgo de sufrir enfermedades cardíacas, cáncer y otras. Este estudio tuvo como objetivo determinar la relación entre el colesterol y el hábito de fumar entre los fumadores activos.*
Métodos: *Esta investigación es un diseño de investigación transversal. Se tomó una muestra de*

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hasta 30 personas mediante una técnica de muestreo intencional de acuerdo con los criterios de inclusión y exclusión que se hayan determinado. El método analítico utilizado es el análisis de tabulación cruzada y el análisis de correlación de Spearman. Los datos utilizados son el nivel de colesterol total y el tabaquismo medidos mediante el índice de Brinkman.

Resultados: *Los resultados del análisis mostraron que hubo un aumento en los niveles de colesterol entre los fumadores activos con el aumento de la edad. Esto se debe a un aumento en la cantidad de cigarrillos consumidos todos los días. Los niveles de colesterol tienen una correlación positiva de 0,386 con el hábito de fumar medido por el índice de Brinkman. Esto significa que un aumento en el hábito de fumar será seguido por un aumento en los niveles de colesterol. El valor de significación resultante es de 0,035 (P <0,05), lo que significa que existe una relación significativa entre los niveles de colesterol y la conducta tabáquica.*

Conclusión: *Fumar es un mal hábito que afecta en gran medida los niveles de colesterol total en sangre. Este hábito debe evitarse para reducir los factores que provocan el aumento de los niveles de colesterol en la sangre que pueden desencadenar enfermedades como el cáncer, las enfermedades cardiovasculares y el riesgo de muerte. Los fumadores con una alta intensidad de tabaquismo tienden a tener niveles más altos de colesterol total.*

Palabras clave: *Fumadores activos, Índice de Brinkman, colesterol, conducta tabáquica.*

INTRODUCTION

The fact that cigarettes are legalized in almost every country in the world cannot be denied even though it has a negative impact, it can encourage harmful habits that affect active smokers and those around them. According to the World Health Organization (WHO), about six million people die each year from smoking-related complications. Even more than 600 000 passive smokers are exposed to the same disease due to the dangers of cigarette smoke (1). Furthermore, the direct impact of smoking is indicated by an increased risk of death from diseases such as cancer, and respiratory diseases (2-4), decreased mental health, and increased drug use (1,5-7). Meanwhile, the indirect impact can be seen in the harmful effects of cigarette smoke on passive smokers (8,9).

Indonesia's adult smokers have increased in the last ten years. The results of the ministry of health's 2021 survey through the Global Adult Tobacco Survey (GATS) showed that the number of smokers in 2021 reached 69.1 million, an increase of 8.8 million smokers compared to 2011 data. Another worrying finding also shows that socio-economically, household spending on cigarette products is even higher than the figure used for nutritious food, where the average spending on cigarettes reaches 382 091 thousand rupiahs per month. The results of the GATS survey in 2021 also show an increase in the prevalence of electronic smokers up to 10 times, from 0.3 % in 2011 to 3 % in 2021. In addition, the prevalence of passive smoking has also increased to 120 million people (10).

Smoking behaviour has been shown to change lipoprotein levels. For example, Komiya et al. in 2006 on male smokers in Japan found that smokers with a Brinkman index of about 554 will have a 1.657 times higher probability of having abnormal triglyceride levels (11). Kuzuya et al. in 2006 also found research results that smokers will have lower levels of High-Density Lipoprotein (HDL) and Low-Density Lipoprotein (LDL), lower total cholesterol levels, and higher triglyceride levels when compared to non-smokers (12). In addition, nicotine and other particles in cigarettes are known to cause an increase in the secretion of catecholamines, cortisol, and growth hormone, resulting in the release of free fatty acids, which in turn can affect LDL concentrations and contribute to a decrease in HDL (13-15).

Smoking behaviour is also one of the factors that can increase cholesterol. The chemical content in cigarettes can reduce HDL levels and increase LDL levels. This causes fat from the liver to be carried back to the body's tissues (16). Smoking habits are also at high risk for atherosclerosis, coronary artery disease, and peripheral vascular disease. The possibility of blood clots, impaired arterial wall integrity, and changes in blood lipids and protein concentrations are a consequence of smoking because smoking can increase the tendency of blood cells to clot and then stick to the inner lining of blood vessels.

Furthermore, this can increase the risk of platelet clumping, which usually occurs in areas affected by the presence of atherosclerosis (17). In addition, nicotine in cigarettes can cause the narrowing of the end of the bronchioles in the lungs, thereby increasing the resistance to air

entering the lungs. As a result of this resistance, it encourages an increase in haemoglobin levels to meet the oxygen needs in the body. According to Majid 2017, an increase in haemoglobin levels can ultimately spur viscosity in the blood, causing impaired blood flow, obstruction of oxygen supply and distribution of food essences, and disturbances in fat metabolism in the body (18).

The results of a survey conducted by researchers in Wates Tanjung Village, Gresik Regency, show that the development of the number of coffee shops is thought to be related to the increasing number of active smokers in the village. The researchers' observations also showed that more than 15 active smokers visited most coffee shops in one observation session. In addition, pre-analytical results conducted on 30 smokers showed that most of the samples had cholesterol in the high category. This phenomenon is interesting concerning the theoretical study of the relationship between cholesterol levels and smoking behaviour.

METHODS

This quantitative descriptive study is used to determine the relationship between cholesterol levels and smoking behaviour. The population used in this study is active smokers in Gresik Regency, Indonesia. The research sample used purposive sampling following the predetermined inclusion and exclusion criteria, totaling 30 respondents. The inclusion criteria used were male smokers aged over 20 years and willing to fill out informed consent. Meanwhile, the exclusion criteria in this study were respondents who were not willing to fill out informed consent. This research was carried out in March-June 2021. Laboratory testing was carried out at the integrated chemistry laboratory of Anwar Medika University. The data used in this study is the result of cholesterol examination in capillary blood samples. Other primary data are the length of smoking and the number of cigarettes consumed in one day. The data is then used in calculating the Brinkman Index to determine the level of smoking behaviour of the subjects studied. The Brinkman Index is the product of the average number of cigarettes consumed daily and the length of smoking in one year. The level of smoking behaviour is based on the Brinkman Index, namely: 1) Light smokers, namely with an interval score of 0-199, 2) Moderate smokers, namely with an interval score of 200-599, 3) Heavy smokers, namely with a score above or equal to 600. The quantitative method used is descriptive analysis through cross-tabulation and Spearman correlation analysis to determine the close relationship between cholesterol levels and smoking behaviour as measured by the Brinkman Index.

RESULTS

Table 1 shows that the age group of early and late adulthood dominates the research subjects, as many as 8 out of 30 active smokers studied. These results confirm that most active smokers in Wates Tanjung Village, Gresik Regency are between 32-45 years old, including adulthood. Data on the total number of subjects based on cholesterol levels showed that most of the smokers studied had high cholesterol, as many as 18 people (60 %) of the total subjects. Smokers with high cholesterol are relatively dominated by early adulthood, late elderly, and seniors, each of which is 4 people. In general, the distribution of age groups based on cholesterol levels tends to show that the higher the age of smokers in Wates Tanjung Village, Gresik Regency, the higher their cholesterol levels. Table 1 also shows that for most smokers studied, as many as 13 people (43.3 %) out of 30 had smoked for 11-20 years. The distribution of age groups based on the length of smoking tends to show an increase in the length of smoking with increasing age.

Most of the smokers studied were 21 people (70 %) consuming 1-10 cigarettes per day, while the remaining 9 (30 %) consumed 11-20 cigarettes per day. Based on the percentage in each age group, it can be seen that the late teens dominate among smokers who consume 1-10 cigarettes per day to late adults with a total of 17 smokers. Furthermore, smokers who consume 11-20 cigarettes per day are dominated by the elderly, as many as 4 people. In general, the distribution of age groups based on the number of cigarettes consumed per day tends to show an increase in the number of cigarettes consumed along with the increasing age of smokers. Table 1 also shows that

Table 1

Cross Tabulation of Age Groups with Cholesterol Levels, Length of Smoking, Number of Cigarettes Consumed, and Brinkman Index (n=30)

Age Group	Cholesterol			Smoking Period (Years)				Many Cigarettes Consumed (Stems)			Brinkman Index (Smoker)		
	Normal n (%)	High n (%)	Total n (%)	1-10 n (%)	11-20 n (%)	>20 n (%)	Total n (%)	1-10 n (%)	11-20 n (%)	Total n (%)	Light n (%)	Moderate n (%)	Total n (%)
Late Teen	0 (0)	1 (100)	1 (100)	1 (100)	0 (0)	0 (0)	1 (100)	1 (100)	0 (0)	1 (100)	1 (100)	0 (0)	1 (100)
Early Adult	4 (50)	4 (50)	8 (100)	5 (62.5)	3 (37.5)	0 (0)	8 (100)	8 (100)	0 (0)	8 (0)	8 (100)	0 (0)	8 (100)
Late Adult	6 (75)	2 (25)	8 (100)	1 (12.5)	6 (75)	1 (12.5)	8 (100)	8 (100)	0 (0)	8 (0)	8 (100)	0 (0)	8 (100)
Early Elderly	2 (40)	3 (60)	5 (100)	1 (20)	2 (40)	2 (40)	5 (100)	3 (60)	2 (40)	5 (100)	3 (60)	2 (40)	5 (100)
Late Elderly	0 (0)	4 (100)	4 (100)	0 (0)	1 (25)	3 (75)	4 (100)	1 (25)	3 (75)	4 (100)	1 (25)	3 (75)	4 (100)
Seniors	0 (0)	4 (100)	4 (100)	0 (0)	1 (25)	3 (75)	4 (100)	0 (0)	4 (100)	4 (100)	0 (0)	4 (100)	4 (100)
Total	12 (40)	18 (60)	30 (100)	8 (26.7)	13 (43.3)	9 (30)	30 (100)	21 (70)	9 (30)	30 (100)	21 (70)	9 (30)	30 (100)

most of the smokers studied, namely 21 people (70 %), belong to the category of light smokers, which are 1-10 cigarettes per day, while the remaining 9 people (30 %) belong to the category of heavy smokers. Based on the percentage in each age group, it can be seen that the late teens dominate among light smokers to late adults, with a total of 17 smokers. Furthermore, heavy smokers are dominated by the elderly group, as many as 4 people. Therefore, the distribution of age groups based on the category of smokers according to the Brinkman Index tends to show an increase in smoking behaviour along with the age of smokers in Wates Tanjung Village, Gresik Regency.

The analysis results in Table 2 show that cholesterol has a positive correlation of 0.386 with smoking behaviour as measured by the Brinkman Index. This shows that there is a direct relationship between cholesterol and smoking behaviour, where an increase in smoking behaviour will be followed by an increase in cholesterol levels. The resulting significance value is 0.035 (P <0.05), which means a significant relationship between cholesterol levels and smoking behaviour.

Table 2

Correlation Between Cholesterol and Brinkman Index

Spearman's Correlation	Results
Correlation coefficient	0.386
Significance (P-Value)	0.035
N	30

DISCUSSION

Smoking behaviour is one of the factors that can increase cholesterol. The chemical content in cigarettes can increase the risk of blood clots and can ultimately affect cholesterol levels. In addition, long-term nicotine consumption, including the number of cigarettes consumed, can increase LDL cholesterol and lower HDL cholesterol. Nicotine is also believed to increase free fatty acids, producing excessive LDL cholesterol. Cholesterol levels tend to increase with age. Therefore, steps are needed to maintain health levels at a young age to prevent excessive increases in cholesterol levels. This is important because uncontrolled cholesterol levels can be challenging to treat for years. In addition,

fat accumulation in the blood with age and an unhealthy diet is at risk of increasing cholesterol levels in the blood.

The data processing results using Spearman correlation analysis showed that cholesterol significantly correlated with smoking behaviour. This shows that an increase will follow the higher smoking behaviour in cholesterol levels. Cigarettes contain chemicals that can lower HDL and increase LDL (16). This causes fat from the liver to be brought back to the body tissues so that it can increase cholesterol. In addition, according to Prasetyorini and Permata, 2018, nicotine in cigarettes can also trigger an increase in cholesterol levels so that cholesterol disorders occur in the body (19). Nicotine can worsen blood lipid or cholesterol profile. Nicotine, as the main component of cigarettes, can increase the secretion of catecholamines so that lipolysis increases. According to Alima et al. (2018), increased lipolysis will cause HDL to decrease while triglyceride, cholesterol, and VLDL levels increase (20). In addition, the release of catecholamines will activate adenyl cyclase in adipose tissue (21). This leads to increased lipolysis and the release of free fatty acids. In addition, increased levels of catecholamines can cause insulin release in the blood to increase, so that lipoprotein lipase activity decreases. This condition can further increase triglyceride and total cholesterol levels. The results of this study support previous research, which generally concludes that smoking behaviour is related to cholesterol levels in the blood (21-23).

CONCLUSION

Based on the results of the analysis and discussion, it can be concluded that there is a significant relationship between cholesterol and smoking behaviour. Smokers with higher smoking intensity tend to have higher total cholesterol levels. Smoking is a bad habit that greatly affects total cholesterol levels in the blood, so it is highly recommended to avoid and reduce cigarette consumption to reduce the factors that cause increased cholesterol levels that can trigger diseases such as cancer, heart disease, and the risk of death. However, this study has limitations on exclusion and inclusion criteria, so further exploration is needed, for example, by adding nutritional status to obtain research results that can be generalized to other research objects. In addition, this study is limited to the total cholesterol response, so further research should be carried out on the relationship between smoking behaviour and levels of each type of cholesterol in the blood.

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Antibacterial activity of Indonesian Bidara Upas Tuber (*Merremia Mammosa L.*) against pathogen bacteria

Actividad antibacteriana del tubérculo de Bidara Upas de Indonesia (*Merremia Mammosa L.)* contra bacterias patógenas

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SUMMARY

Introduction: *Infectious diseases are still a problem in developing and tropical countries such as Indonesia. This study aims to determine whether the antibacterial substances contained in Bidara Upas tubers affect the growth of Streptococcus sp., Pseudomonas aeruginosa, Escherichia coli Extended-spectrum β-lactamase and Methicillin resistance Staphylococcus aureus (MRSA).*
Methods: *The method used in this study was an experimental laboratory using various extract concentrations of 25 %, 50 %, 75 %, and 100 % and positive control of meropenem and chloramphenicol and negative control (DMSO 5 %). The greater the concentration of the extract of the Bidara Upas tuber, the wider the zone of inhibition. The tuber of Bidara Upas has antibacterial activity against Streptococcus sp., Pseudomonas aeruginosa, E. coli Extended-spectrum β-lactamase (ESBL), and Methicillin-Resistant Staphylococcus aureus (MRSA).*
Results: *The results of the Mann Whitney and Kruskal Wallis test showed that antibacterial activity affects E. coli ESBL and MRSA with sig. ($\alpha < 0.05$). This indicates that there is no significant difference in the use of various concentrations of extracts capable of inhibiting bacterial growth. This study concluded that the greater the concentration of the extract of the Bidara Upas tuber, the wider the zone of inhibition, and the tuber of Bidara Upas had antibacterial activity against Streptococcus sp., Pseudomonas aeruginosa, Escherichia coli ESBL, and MRSA.*
Conclusion: *Indonesian Bidara Upas tuber extract can inhibit pathogen bacteria Streptococcus sp., Pseudomonas aeruginosa, E. coli ESBL, and MRSA with strong activity based on the resulting inhibition zone. The indegenous Indonesian Bidara Upas tuber has potential as an antibacterial agent and can be developed in further research related to in vivo activity tests and activity tests on other pathogenic bacteria.*

Keywords: *Antibacterial, Bidara Upas Tuber, E. coli ESBL, MRSA, Pseudomonas aeruginosa, Streptococcus sp.*

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RESUMEN

Introducción: *Las enfermedades infecciosas siguen siendo un problema en los países en desarrollo y tropicales como Indonesia. Este estudio tiene como objetivo determinar si las sustancias antibacterianas contenidas en los tubérculos de Bidara Upas afectan*

el crecimiento de Streptococcus sp., Pseudomonas aeruginosa, Escherichia coli, β-lactamasa de espectro extendido y Staphylococcus aureus resistente a la meticilina (MRSA).

Métodos: *El método utilizado en este estudio fue experimental utilizando varias concentraciones de extracto al 25 %, 50 %, 75 % y 100 % y control positivo de meropenem y cloranfenicol y control negativo (DMSO 5 %). Cuanto mayor es la concentración del extracto del tubérculo Bidara Upas, más amplia es la zona de inhibición. El tubérculo de Bidara Upas tiene actividad antibacteriana contra Streptococcus sp., Pseudomonas aeruginosa, E. coli BLEE y Staphylococcus aureus resistente a la meticilina (MRSA).*

Resultados: *Los resultados de la prueba de Mann-Whitney y Kruskal Wallis mostraron que la actividad antibacteriana afecta a E. coli BLEE y MRSA con sig. (P < 0,05). Esto indica que no existe una diferencia significativa en el uso de varias concentraciones de extractos capaces de inhibir el crecimiento bacteriano. Este estudio concluyó que cuanto mayor era la concentración del extracto del tubérculo de Bidara Upas, más amplia era la zona de inhibición y el tubérculo de Bidara Upas tenía actividad antibacteriana contra Streptococcus sp., Pseudomonas aeruginosa, E. coli BLEE y MRSA.*

Conclusión: *El extracto de tubérculo de Bidara Upas de Indonesia puede inhibir las bacterias patógenas Streptococcus sp., Pseudomonas aeruginosa, E. coli ESBL y MRSA con una fuerte actividad basada en la zona de inhibición resultante. El tubérculo Bidara Upas autóctono de Indonesia tiene potencial como agente antibacteriano y puede desarrollarse en futuras investigaciones relacionadas con pruebas de actividad in vivo y pruebas de actividad en otras bacterias patógenas.*

Palabras clave: *Antibacteriano, Bidara Upas Tuber, E. coli ESBL, MRSA, Pseudomonas aeruginosa, Streptococcus sp.*

INTRODUCTION

Infectious diseases are the main cause of high mortality rates in developing countries. According to the World Health Organization (WHO), infection was the cause of death in 3.5 million people every year, mostly poor children and children living in low and middle-income countries (1). The COVID-19 pandemic has increased the death rate from infectious diseases in the world and Indonesia (2). One of the diseases that many Indonesian people have suffered since ancient times is an infectious disease (3-6). Infectious diseases can be caused by pathogenic microorganisms, such as *Streptococcus sp.*, *Pseudomonas aeruginosa*, *E. coli* ESBL, and Methicillin-Resistant *Staphylococcus aureus* (MRSA) (7-10).

The development of antibacterial drugs from natural ingredients is needed to reduce the occurrence of antibiotic resistance. One of them is a natural medicine that comes from plants. One of the plants that have been widely used is the Bidara Upas plant *(Merremia mammosa*). Bidara Upas (*Merremia mammosa* (Lour)) is a medicinal plant from Indonesia that can be found in Meru Betiri National Park. This plant from the Convolvulaceae tribe can be used as an anti-inflammatory, analgesic, wound healing, treating snake bites, cancer, leprosy, syphilis, typhus, diphtheria, inflammation, and diabetes (11,12).

This plant contains various secondary metabolites that can be used as medicine (13-15). Bidara Upas contains alkaloids and tannins as antibacterial compounds (13). Research that has been carried out on Bidara Upas, among others, extracts of Bidara Upas tubers can inhibit the growth of various good pathogenic bacteria such as *Microbacterium tuberculosis*, *Salmonella typhi*, *Staphylococcus aureus* (16-18). Research on Bidara Upas tubers has been carried out by several previous researchers with a focus on different pathogens such as *Staphylococcus aureus*, *Escherichia coli*, and Brine Shrimp Lethality Test (15) used *Mycobacterium tuberculosis* (19). However, in this study, researchers used bacteria such as *Streptococcus sp.*, *Pseudomonas aeruginosa*, *E. coli* ESBL, and Methicillin-Resistant *Staphylococcus aureus* (MRSA).

Based on the above background, the researcher has conducted this study to assess the antibacterial activity contained in the Bidara Upas tuber, which functions to inhibit or prevent the growth of bacteria, and to see the potential of the Bidara Upas content in inhibiting antibacterial against the bacteria *Streptococcus sp., Pseudomonas aeruginosa*, *E. coli* ESBL and Methicillin-Resistant *Staphylococcus aureus* (MRSA).

METHODS

Plant Sources and Determination

The Indonesian Bidara Upas tuber plant used in this study was obtained and determined in Batu Materia Medica, Batu, East Java. These tubers were determined based on the results of the determination of kingdom, division, class, order, family, genus, species, and the common name of Bidara Upas tubers in Batu Materia Medica.

Preparation of Fermentation Media

MHA media was prepared by dissolving 1.33 g of MHA media into 35 mL of distilled water. Also, sterilization was carried out by autoclaving for 15 minutes at 121ºC.

Sample Preparation

Bidara Upas tuber powder, as much as 800 g, was extracted with ethanol using the maceration method. Bidara Upas tuber powder was soaked in 6 liters of ethanol for three days with regular stirring. The thick extract of Bidara Upas tuber was obtained as much as 31.1 g. Bidara Upas tuber extract was tested for phytochemical screening and antibacterial activity tests. The thick extract of Bidara Upas tuber was made in 4 concentration series (100 %, 75 %, 50 %, and 25 %) using a 5 % DMSO solution. DMSO 5 % solution was prepared by dissolving 1 mL of concentrated DMSO into sterile distilled water up to 100 mL. Each concentration series was made by adding 5 % DMSO solution into several grams of thick extract of Bidara Upas tuber until the volume was 3 mL.

Inoculum Preparation

Amount of 1 dose of each pure bacterial culture was inoculated on the surface of the media so that it was slanted, then incubated in an incubator at 37ºC for 24 hours. One loop of the rejuvenated bacterial culture on MHA media was suspended in a tube containing 5 mL of NB media and incubated for 24 hours at 37ºC. The bacterial suspension was diluted using sterile 0.9 % NaCl until the turbidity was equivalent to a standard solution of 0.5 Mc. Farland (liquid culture whose turbidity is equivalent to 0.5 Mc. Farland has a population of 1×107 CFU/mL - 1×108 CFU/mL).

Antibacterial Activity Test of Ethanol Extract Using Disc Method

The antibacterial test method used in this study was the disc diffusion method (Kirby-Bauer test). Prepare a Petri dish that has been sterilized, pour 1 mL of the bacterial suspension to be inoculated, then pour 35 mL of MHA media on each Petri dish and shake it around like a figure eight and wait until it solidifies. Place the paper discs soaked in each treatment using the tip of sterile tweezers. Each Petri dish consisted of 6 paper discs, and in each plate contained each treatment group (negative control, positive control, extract concentration 100 %, extract concentration 75 %, extract concentration 50 %, and extract concentration 25 %). After the disc, the paper is embedded in the Petri dish and then closed. The mouth of the Petri dish is passed through the fire and then wrapped. Then incubated at 31-37ºC for 24 hours. Each sample's zone of inhibition (mm) was measured (20).

RESULTS

Bidara Upas is a woody vine with a stem length of 3-6 m. The stem is a bit slippery, small, and purplish red. Bulbs are in the ground, elongated round shape. The tuber skin is brownish-yellow, thick, and gummy. The tuber flesh is white (21).

Figure 1. Indoensian Bidara Upas (*Merremia mammosa L.*).

Based on Table 1, the extract of Indonesian Bidara Upas tuber (*Merremia mammosa L.*) contains alkaloids, flavonoids, saponins, tannins, and terpenoids.

Table 1

Phytochemical screening results of Bidara Upas tuber (*Merremia mammosa* L.) Extract

Screening test	Results	Information
Alkaloids	+	Mayer formed a yellow precipitate Dragendorph formed a red precipitate, Wagner formed a brown precipitate
Flavonoids	+	Change color to orange
Saponins	+	Stable foam is formed for 10 minutes
Tannins	+	Change color to dark green
Terpenoids	+	Change color to red
Steroids	-	Does not turn green

+: Indicates presence of secondary metabolites
-: Indicates the absence of secondary metabolites

Phytochemical screening in this study was conducted to determine the content of secondary metabolites in the ethanol extract of Bidara Upas tubers. This study is following research by Pereda et al. in 2009 (22) which showed that Bidara Upas tubers contain secondary metabolites of alkaloids, flavonoids, saponins, tannins, phenolics and triterpenoids.

The results obtained from the antibacterial activity test of the tuber of Bidara Upas (*Marremia mammosa*) against the bacterium *Pseudomonas aeruginosa* found that a concentration of 25 % had an average inhibition zone of 1.75 mm, which was included in the resistant category. The 50 % concentration has an average inhibition zone of 2.25 mm, including the resistance category, the 75 % concentration has an average inhibition zone of 2.5 mm, including the resistance category, and the 100 % has an average inhibition zone of 3.5 mm, which included in the category of resistance and negative control did not form an inhibition zone. While the positive control, namely the antibiotic chloramphenicol, showed an average diameter of the inhibition zone of 1.25 mm, which means this antibiotic, according to the Clinical and Laboratory Standards Institute (CLSI),

Table 2

Antibacterial activity test results

Sample	Bacteria inhibition zone *Pseudomonas aeruginosa* SD	Category	Bacteria inhibition zone *Streptococcus sp*±SD	Category	Bacteria inhibition zone *E. coli* ESBL±SD	Category	Bacteria inhibition zone MRSA±SD	Category
K(-)	0±0.00^{b}	-	0±0.00^{b}	-	0±0.00^{b}	-	0±0.00^{b}	-
K(+)	1.25±0.50^{b}	Resistant	1.75±0.95^{b}	Resistant	10±0.00^{b}	Resistant	9.5±1.00^{b}	Resistant
25 %	1.75±0.50^{a}	Resistant	1.5±0.57^{a}	Resistant	1±0.81^{a}	Resistant	1±0.00^{a}	Resistant
50 %	2.25±0.50^{a}	Resistant	2.5±0.57^{a}	Resistant	2±0.81^{b}	Resistant	4.25±2.21^{a}	Resistant
75 %	2.5±0.57^{a}	Resistant	3.75±0.95^{a}	Resistant	2.5±0.57^{a}	Resistant	4.25±0.95^{a}	Resistant
100 %	3.5±0.57^{a}	Resistant	4.75±0.05^{a}	Resistant	4.5±1.73^{b}	Resistant	6.75±2.87^{a}	Resistant

a = Significant difference
b = The difference is not significant
K- = Negative Control
K+ = Positive Control
K25 % = Concentration 25 %
K50 % = 50 % concentration
K75 % = 75 % concentration
K100 % = 100 % concentration

chloramphenicol if the diameter of the inhibition zone <12 mm is categorized as resistant so that the bacteria are resistant to the ethanol extract of the Bidara Upas tuber. For the test results of the antibacterial activity of Bidara Upas tubers (*Marremia mammosa*) against *Streptococcus sp*. bacteria, it was found that a concentration of 25 % had an average inhibition zone of 1.5 mm including the resistant category, a concentration of 50 % had an average inhibition zone of 2.5 mm which included in the resistant category, 75 % concentration had an average inhibition zone of 3.75 mm which was included in the resistant category, and 100 % concentration had an average inhibition zone of 4.75 mm which was included in the resistant category. Negative control did not form a zone of inhibition. While the positive control, namely the antibiotic chloramphenicol, showed an average diameter of the inhibition zone of 1.75 mm, which means this antibiotic is classified as Resistant.

The results obtained from the antibacterial activity test of Bidara Upas (*Marremia mammosa*) tubers against *E. coli* ESBL bacteria found that a concentration of 25 % had an average inhibition zone of 1 mm, which was included in the weak category. The 50 % concentration has an average inhibition zone of 2 mm, which is included in the resistant category, the 75 % concentration has an average inhibition zone of 2.5 mm, which is included in the resistance category, and the 100 % has an average inhibition zone of 4.5 mm which is included in the category of resistance. And negative control did not form an inhibition zone. While the positive control, namely the antibiotic meropenem showed an average diameter of the inhibition zone of 10 mm, which means this antibiotic, according to the Clinical and Laboratory Standards Institute (CLSI), meropenem if the diameter of the inhibition zone of 15 mm is categorized as resistant so that the bacteria are resistant to the ethanol extract of the Bidara Upas tuber. The test results of the antibacterial activity of Bidara Upas tubers (*Marremia mammosa*) against MRSA bacteria found that a concentration of 25 % formed an inhibition zone of 1 mm categorized as resistant. In comparison, concentrations of 50 % and 75 % formed an inhibition zone of 4.25 mm categorized as resistant. A concentration of 100 % formed an inhibition zone of 4.25 mm. the 6.75 mm inhibition zone was categorized as resistant, and the negative control did not form an inhibition zone. While the positive control, namely the antibiotic meropenem, showed an average diameter of the inhibition zone of 9.5 mm, which means this antibiotic is classified as Resistant so that MRSA bacteria are resistant to the ethanol extract of Bidara Upas tuber. It can be concluded that the higher the concentration, the wider the inhibition zone formed.

For the test results of the antibacterial activity of Bidara Upas tuber (*Marremia mammosa*) against MRSA bacteria, it was found that a concentration of 25 % formed an inhibition zone of 1 mm which was categorized as resistant, while concentrations of 50 % and 75 % formed an inhibition zone of 4.25 mm which was categorized as resistant, and a concentration of 100 % formed an inhibition zone of 4.25 mm, and a concentration of 100% formed an inhibition zone of 6.75 mm inhibition zone categorized as resistant, and the negative control did not form an inhibition zone. While the positive control, namely the antibiotic meropenem, showed an average diameter of the inhibition zone of 9.5 mm, which means this antibiotic is classified as Resistant so that MRSA bacteria are resistant to the ethanol extract of Bidara Upas tuber. It can be concluded that the higher the concentration, the wider the inhibition zone formed. While the positive control, namely the antibiotic meropenem, showed an average diameter of the inhibition zone of 9.5 mm, which means this antibiotic is classified as Resistant so that MRSA bacteria are resistant to the ethanol extract of Bidara Upas tuber. It can be concluded that the higher the concentration, the wider the inhibition zone formed.

DISCUSSION

Bidara Upas tubers were obtained. Results from phytochemical screening showed that the ethanolic extract of Bidara Upas tubers was positive for alkaloids, flavonoids, saponins, tannins, and terpenoids. While the steroid compound test showed negative results. Ethanol extract of Bidara Upas tuber (*Marremia mammosa*) can provide antibacterial activity against *Streptococcus sp., Pseudomonas*

aeruginosa, *E. coli* ESBL and MRSA at all concentrations. And this study proves that the higher the concentration of Bidara Upas tuber extract given, the larger the diameter of the inhibition zone formed around the paper disc.

This study is in accordance with research conducted in previous research stated the presence of alkaloids and flavonoids in Bidara Upas tuber extract (23) and Bidara Upas tubers contain secondary metabolites of alkaloids, flavonoids, saponins, tannins, phenolics, and triterpenoids (22).

The activity of the ethanolic extract of Bidara Upas tuber in inhibiting the growth of gram-positive bacteria *Streptococcus sp*. and MRSA was more sensitive than the gram-negative bacteria *Pseudomonas sp*. and *E. coli* ESBL. This is in accordance with the statement that the inhibition zone of gram-positive bacteria is larger than that of gram-negative bacteria (24). This indicates that the extract is more sensitive to gram-positive bacteria. In this case, *Streptococcus sp*. and MRSA were gram-positive bacteria that were more sensitive to the extract than *Pseudomonas sp*. and *E. coli* ESBL. This difference in activity is due to differences in the structure and components of the bacterial cell wall. The peptidoglycan layer on the cell wall of gram-negative bacteria is thinner, whereas, in Gram-positive bacteria, the peptidoglycan layer is thicker. In addition, the components that make up the cell wall of gram-negative bacteria are more complex because they have an additional outer membrane layer, so it is easier to penetrate the cell walls of gram-positive bacteria than gram-negative ones. In the calculation of the clear zone of the two Petri dishes, it can be seen that the clear zone of the samples in the *Streptococcus sp*. and *E. coli* ESBL cultures was wider than the positive control.

CONCLUSION

Ethanol extract of Bidara Upas tuber (*Marremia mammosa*) can provide antibacterial activity against *Pseudoemonas aeruginosa*, *Streptococcus sp*., *E. coli* ESBL, and MRSA at all concentrations characterized by the formation of a clear zone around the paper disc.

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ARTÍCULO ORIGINAL

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Immunomodulator activity test of ethanol extract of Sappan Wood (*Caesalpinia Sappan L.)* in mice (*Mus Musculus*) infected by *Staphylococcus aureus*

Prueba de actividad inmunomoduladora del extracto etanólico de madera de Sappan (*Caesalpinia Sappan L.*) en ratones (*Mus Musculus*) infectados por *Staphylococcus aureus*

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SUMMARY

Introduction: *The potential of immunomodulators from a natural product is widely studied as a choice of natural immune support supplements. In Indonesia, Caesalpinia sappan (Sappan wood) is a traditional herbal drink to boost the immune system. Sappan wood contains potential compounds as immunomodulators, such as brazilin, sappanchalcone, and phenol. This study aims to determine the immunomodulatory activity of Sappan wood infected by Staphylococcus aureus.*
Methods: *This study was a true experimental design that used Mus musculus infected by Staphylococcus aureus (10^{-9} CFU/mL). This study consisted of normal control, negative control (placebo), positive control (immune booster), and 96 % ethanol extract of Sappan wood (SWEE) 25, 50, 100, and 200 mg/kg body weight. The treatment was given for 7 days after the Staphylococcus aureus infection.*
Results: *One-way ANOVA analysis showed that the administration of 96 % ethanol extract from Sappan wood on phagocytic activity, C-Reactive Protein (CRP), and total leukocyte levels was significantly different from negative control ($p=0.0001$), but not to normal and positive control ($p<0.05$). The ethanol extract of Sappan wood at 100 and 200 mg/ kg body weight increases the phagocytic index to 1.32 and 1.54 folds. It also can reduce CRP levels to 60 and 48 mg/L. The lower CRP level indicates lower inflammation.*
Conclusion: *Sappan wood has immunomodulatory activity through increased phagocytic activity, decreased CRP levels, and normalized total leukocyte levels, especially at 100 and 200 mg/kg body weight. The extract can enhance total leukocyte levels and positively affect CRP levels.*

Keywords*:* C-Reactive protein*, immunomodulator, leukocytes, phagocytosis, Sappan wood.*

RESUMEN

Introducción: *El potencial de los inmunomoduladores de un producto natural es ampliamente estudiado como una opción de suplementos naturales de apoyo inmunológico. En Indonesia, Caesalpinia sappan*

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(madera de Sappan) es una bebida tradicional a base de hierbas para estimular el sistema inmunológico. La madera de sappan contiene compuestos potenciales inmunomoduladores, como la brasilina, la sappanchalcona y el fenol. Este estudio tiene como objetivo determinar la actividad inmunomoduladora de la madera de Sappan infectada por Staphylococcus aureus.

Métodos: *Este estudio fue experimental que utilizó Mus musculus infectado por Staphylococcus aureus (10-9 UFC/mL). Consistió en un control normal, un control negativo (placebo), un control positivo (refuerzo inmunitario) y 25, 50, 100 y 200 mg/kg de peso corporal del extracto etanólico de madera de Sappan (SWEE) al 96 %. El tratamiento se administró durante 7 días después de la infección por Staphylococcus aureus.*

Resultados: *El análisis ANOVA de una vía mostró que la administración de extracto etanólico al 96 % de madera de Sappan sobre la actividad fagocítica, la proteína C reactiva (PCR) y los niveles totales de leucocitos fue significativamente diferente del control negativo (p=0,0001), pero no un control normal y positivo (p<0,05). El extracto etanólico de madera de Sappan a 100 y 200 mg/kg de peso corporal aumenta el índice fagocítico hasta 1,32 y 1,54 veces. También puede reducir los niveles de CRP a 60 y 48 mg/L. El nivel más bajo de PCR indica una inflamación más baja.*

Conclusión: *La madera de sappan tiene actividad inmunomoduladora a través de una mayor actividad fagocítica, disminución de los niveles de PCR y normalización de los niveles totales de leucocitos, especialmente a 100 y 200 mg/kg de peso corporal. El extracto puede mejorar los niveles totales de leucocitos y afectar positivamente los niveles de PCR.*

Palabras clave: *Proteína C reactiva, inmunomodulador, leucocitos, fagocitosis, Sappan wood.*

INTRODUCTION

The immune system has the basic function of protecting against foreign pathogens and infectious agents, consisting of innate and adaptive immunity with various cells and molecules involved (1-3). Innate immunity is a non-specific immune response as a first-line defense such as physical barriers, anatomical barriers, epithelial and phagocytic cell enzymes, phagocyte, inflammations-relate serum proteins, surface and phagocyte granule antimicrobial peptides, the immune receptor on cells, and cells that release cytokines and inflammatory mediators (4-6). Innate immunity is followed by adaptive immunity, a specific immune response, and complex. Adaptive immunity consists of antibody response (B cell) and cell-mediated response (T helper and Cytotoxic T lymphocyte) (7).

Immunomodulators are synthetic or natural substances that can stimulate, suppress, or modulate any aspect of the immune system, including innate and adaptive immunity. In clinical medicine, immunomodulators are usually used to treat infection, reconstitute immunodeficiency, and suppress excessive immune function (8-10). Immunomodulators consist of immunoadjuvants, immunostimulants, and immunosuppressants. Immunoadjuvant is used for enhancing the efficacy of vaccines (specific immunostimulants). Immunostimulant is used to enhance the immune system and against infection. Immunosuppressant suppresses excessive immune function (11).

Currently, immunomodulator from natural compounds (phytochemical) is preferable because it has lower toxicity (12,13). The most common phytochemicals that can modulate immune response are flavonoids, flavanols, quinones, glycosides, polysaccharides, terpenoids, alkaloids, phenolics, saponins, various bitter, vitamin C, etc. (14).

Caesalpinia sappan (Sappan wood) is a traditional medicinal plant used in Asia, including Indonesia. Indonesians consume Sappan wood to increase stamina and maintain a healthy body. Sappan wood has antioxidant, antibacterial, antiviral, antifungal, cardiovascular protection, anti-inflammatory, antidiabetic, anticancer, anti-malarial, and gastroprotective roles (15). Sappan wood contains homoisoflavonoid and phenolics such as 4-O-methylsappanol, protosappanin A, protosappanin B, protosappanin E, brazilin, brazilein, caesalpin, brazilide A, neosappanone A, caesalpin P, sappanchalcone, 3-deoxysappanone,10 7,3',4'-trihydroxy-3- benzyl-2H-chromene (16). Purifie brazilin (10 mg/kg body weight) isolated from Sappan wood reduced the arthritis index score, and acute inflammation was administered every three days for 21 days. Other research show that 124 mg Sappanchalcone from the dried heartwood of Sappan wood regulates the level of proinflammatory cytokines such as TNF-α, IL-1β, and IL-6 (17). In addition, Sappan wood (25 mg/ kg body weight) has an immunomodulatory effect on murine peritoneal macrophages (18).

Staphylococcus aureus can cause some disturbances to cells that play a role in the immune system, one of which is the virulent *Staphylococcus aureus*

in the form of A protein that can cause binding to immunoglobulin receptors (19). In addition, *Staphylococcus aureus* causes excessive production of proinflammatory cytokines, resulting in inflammation and systemic shock (20). Leucocidin enzymes can destroy leukocytes, neutrophils, and macrophages. Coagulase enzymes can accelerate the formation of fibrin so that it blocks the phagocytosis process. *Staphylococcus aureus* has also increased C-Reactive Protein levels (CRP) *in vitro* (21).

Leukocytes are an important part of the body's defense system, fighting infection-causing microorganisms, tumor cells, and harmful foreign substances. Leukocytes protect the body against various diseases using phagocytes and produce antibodies. The main cells that play a role in non-specific defense are mononuclear (monocytes and macrophages). Both types of cells are derived from white blood cells. Early phagocytosis of bacterial invasion can prevent disease (1).

C-Reactive Protein (CRP) is an alpha globulin present in the serum as a non-specific immune response when inflammation occurs. CRP is an acute phase protein that can increase in value up to 1 000 times at the site of inflammation or infection. An immunomodulator is a drug that can be used to restore and repair an impaired immune system (22). Based on the above background, this research aims to determine the immunomodulatory activity of Sappan wood in *Mus musculus* infected by *Staphylococcus aureus*.

METHODS

This research was an true experimental design that used Mus musculus (mice) with pre and post-design. The mice were infected by *Staphylococcus aureus* (10^{-9} CFU/mL). This research was divided into 7 groups: normal control, negative control (CMC-Na 1 %), positive control (immune booster), and 96 % ethanol extract of Sappan wood 25, 50, 100, and 200 mg/kg body weight. The treatment was given for 7 days after the *Staphylococcus aureus* infection. This research is a pre-clinical study using experimental animals and has received an ethics certificate numbered 632/RSAM/III/2021.

The extraction of Sappan wood was carried out using the maceration method. The 500 g of extracted sample was placed into a vessel and dissolved in 3 750 mL of 96 % ethanol as solvent. Maceration was carried out for 5 days with stirring 3 times a day. The extract was filtered to separate the filtrate. The filtrate was then concentrated with a rotary evaporator at a temperature of 65°C to obtain a thick extract of Sappan wood. Phytochemical tests were carried out to determine the content of Sappan wood extract, including flavonoids, alkaloids, tannins, polyphenols, anthraquinones, saponins, steroids, and terpenoids. Sappan wood ethanol extract solution was made with 4 concentrations: 25, 50, 100, and 200 mg/kg body weight. The treatment was adjusted according to the body weight of each mouse.

Staphylococcus aureus was grown on nutrient agar media and incubated for 1 x 24 h. First, the preparation of 10^{-9} CFU/mL bacterial suspension was done by adding 1 mL of bacterial suspension into 9 mL of sterile distilled water in the 1st test tube to form a bacterial concentration of 10^{-1} CFU/mL. Then, the dilution was carried out by taking 1 mL in the 1st tube and adding 9 mL of sterilized distilled water to form a suspension with a concentration of 10^{-9} CFU/mL.

Mice that had been acclimatized for 7 days were then infected with *Staphylococcus aureus*. After 1x24 h, the mice were grouped into 7 test groups: normal control, negative control (CMC-Na 1 %), positive control (immune booster), and 96 % ethanol extract of Sappan wood 25, 50, 100, and 200 mg/kg body weight. The treatment was given for 7 days.

Parameters in this immunomodulatory activity test included total leukocyte count, phagocytosis index, and CRP levels. Measurement of leukocyte count, index, and CRP levels before and after treatment (pre and post-design). The total leukocyte was measured by using Hematology Analyzer. The phagocytosis index was measured using the Carbon Clearance method on a UV-Vis Spectrophotometer with a wavelength of 650 nm. CRP levels were measured using a semi-quantitative method. The data that has been obtained was analyzed statistically using a t-test and one-way ANOVA.

RESULTS

Phytochemical Test of Sappan Wood Ethanol Extract

Based on the phytochemical test, it is known that the ethanol extract of Sappan wood contains the group of compounds shown in Table 1.

Table 1

Phytochemical Test of Sappan Wood Ethanol Extract

Group of Compounds	Results
Flavonoid	+
Alkaloid	+
Polyphenol	+
Saponin	+
Anthraquinone	+
Steroid	-
Terpenoid	-

Phagocytic Activity Test

Phagocytic activity was measured from the phagocytic index using the carbon clearance method. The result phagocytic activity test is shown in Table 2 and Figure 1.

Based on paired sample t-test, post and pre-test is significantly different with significant value p=0.007 ($p<0.05$) and t-count > t-table (3.959 > 2.364). This result shows that the administration of Sappan wood ethanol extract increases the phagocytic index.

The enhancement of the phagocytic index before and after treatment can be seen in the graph in Figure 1.

Table 2

Phagocytic Activity Test Pre and Post Design

Treatment Groups	Phagocytic Index	
	Pre (Mean ± SD)	Post (Mean ± SD)
Normal Control	1.4 ± 0.017	1.9 ± 0.008
CMC Na 1 %/ infected only (Negative Control)	1.4 ± 0.003	1.6 ± 0.013
Immuno Booster (Positive Control)	1.6 ± 0.021	3.8 ± 0.015
SWEE 25 mg/ kg body weight	1.5 ± 0.011	2.1 ± 0.015
SWEE 50 mg/ kg body weight	1.7 ± 0.001	2.6 ± 0.003
SWEE 100 mg/ kg body weight	1.6 ± 0.008	2.9 ± 0.011
SWEE 200 mg/ kg body weight	1.7 ± 0.013	3.2 ± 0.007

SWEE: Sappan Wood Ethanol Extract

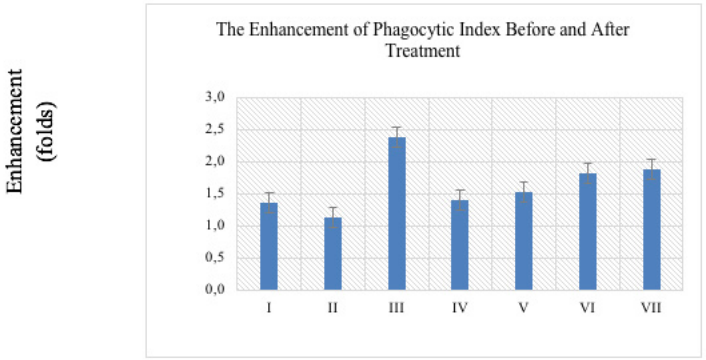

Figure 1. The Enhancement of Phagocytic Index Before and After Treatment. Treatment I: Normal Control, II: CMC Na 1 %/ infected only (Negative Control), III: Immuno Booster (Positive Control), IV: SWEE 25 mg/ kg body weight, V: SWEE 25 mg/ kg body weight, VI: SWEE 25 mg/ kg body weight, VII: SWEE 25 mg/ kg body weight.

The graph shows that an immune booster can increase the phagocytic index 2.4 folds, while the administration of ethanol extract of Sappan wood 25, 50, 100, and 200 mg/ kg body weight successively increased the phagocytic index by 1.4, 1.5, 1.8 and 1.9 folds respectively. This result differs from the negative control group with *Staphylococcus aureus* infection only without treatment. The phagocytic index is quite low.

One-way ANOVA show there are significant differences among 7 treatments with significant value p=0.0001 and F-count > F table (639.48 > 2.29). The result of one-way ANOVA is shown in Table 3.

The statistical test shows that the phagocytic index significantly differs between the infection condition (negative control) and the normal condition. The phagocytic index in normal conditions is higher than in infection conditions. The administration of an immune booster (positive control) is proven to increase phagocytic index 2.4 folds and is significantly different from the normal and negative control. The administration of ethanol extract from Sappan wood is proven to increase phagocytic index on 100 and 200 mg/kg body weight until 1.32 and 1.54 folds. It is significantly different from the normal and negative control.

Table 3

The Difference in Phagocytosis Index Before and After Treatment

Treatment Groups	Mean ± SD
Normal Control	0.54a ± 0.05
CMC Na 1 %/ infected only (Negative Control)	0.18b ± 0.04
Immuno Booster (Positive Control)	2.16c ± 0.05
SWEE 25 mg/ kg body weight	0.6a ± 0.1
SWEE 50 mg/ kg body weight	0.74a ± 0.05
SWEE 100 mg/ kg body weight	1.32d ± 0.04
SWEE 200 mg/ kg body weight	1.54e ± 0.01

SWEE: Sappan Wood Ethanol Extract

C-Reactive Protein (CRP) Test

The graph of CRP levels after each treatment is shown in Figure 2.

CRP levels in the normal group, negative control, positive control, SWEE 25, 50, 100, and 200 mg/ kg body weight were 0, 96, 12, 96, 84, 60, and 48 mg/L. CRP is not produced in the normal condition, but high in infection (negative control). The immune booster can decrease CRP level to 12 mg/L. The ethanol extract of Sappan wood at 100 and 200 mg/kg body weight can decrease CRP levels to 60 and 48 mg/L. The lower CRP level indicates lower inflammation.

Total Leukocyte Level

The total leukocyte was measured on the last day after treatment. The total leukocyte is shown in Figure 3. The result shows that the normal condition's leukocyte level is ± 1.5 x 10^3 cell/ mm^3. *Staphylococcus aureus* infection increases leukocyte infection until ± 16.7 x 10^3 cell/ mm^3. The leukocyte

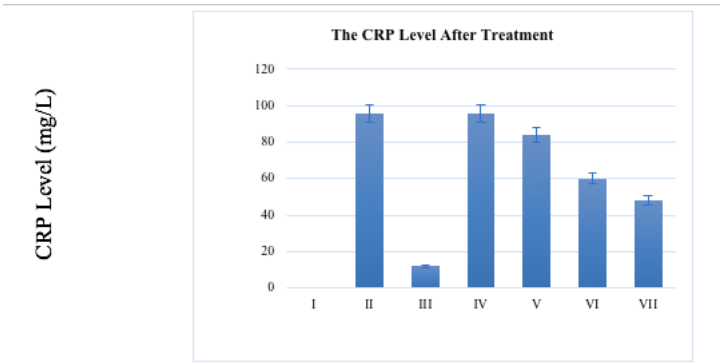

Figure 2. The CRP Level After Treatment and *Staphylococcus aureus* infection. Treatment I: Normal Control, II: CMC Na 1 %/ infected only (Negative Control), III: Immuno Booster (Positive Control), IV: SWEE 25 mg/ kg body weight, V: SWEE 25 mg/ kg body weight, VI: SWEE 25 mg/ kg body weight, VII: SWEE 25 mg/ kg body weight.

level if positive control is ± 11.2 x 10^3 cell/ mm^3. The leukocyte ethanol extract of Sappan wood 25, 50, 100, and 200 mg/ kg body weight respectively are ± 15.8 x 10^3, 14.2 x 10^3, 13.6 x 10^3, and 12.2 x 10^3 cell/ mm^3. The leukocyte level of ethanol extract of Sappan wood is in the normal range.

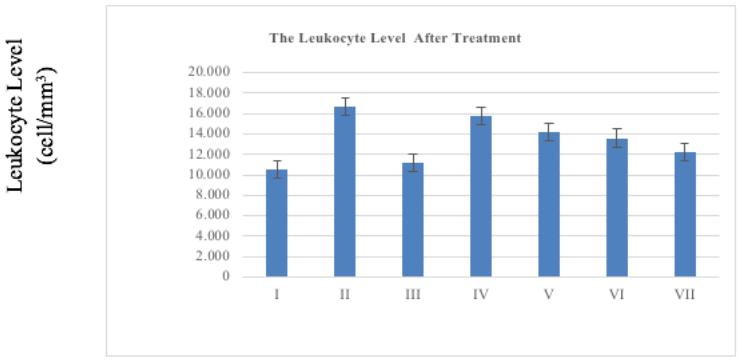

Figure 3. The Leukocyte Level After Treatment and *Staphylococcus aureus* infection. Treatment I: Normal Control, II: CMC Na 1 %/ infected only (Negative Control), III: Immuno Booster (Positive Control), IV: SWEE 25 mg/ kg body weight, V: SWEE 25 mg/ kg body weight, VI: SWEE 25 mg/ kg body weight, VII: SWEE 25 mg/ kg body weight.

DISCUSSION

Based on the phytochemical test in this research, we know that Sappan wood contains flavonoids, alkaloids, polyphenols, saponin, and anthraquinone but not steroids and terpenoids. Based on the literature, ethanol 95 % Sappan wood extract contains an alkaloid, flavonoid, anthraquinones, coumarin, saponin, tannin, and cardiac glycoside but does not contains steroid and terpenoid (23). Sappan wood also contains phenolic compounds, mainly including phenolic acids, flavonoids, tannins, coumarins, lignans, quinones, stilbenes, and curcuminoids (24). Sappan wood also contains several aromatic compounds such as brazilin, sappanchalcone, caesalpin, protosappanin A and B, homo-isoflavonoids β-sitosterol, mono-hydroxybrazilin, and quercetin (25).

Phagocytic tests show that ethanol extract of Sappan wood 100 and 200 mg/kg body weight significantly increases phagocytic index until 1.32 and 1.54 folds. Meanwhile, the immune booster (positive control) can increase the phagocytic index by 2.16 folds. Phagocytosis is a complex process for the ingestion and elimination of pathogens and apoptotic cells, tissue homeostasis, control the important aspect of inflammation and immune response. The phagocytic cells in the immune system such as monocytes, macrophages, neutrophils, dendritic cells, osteoclasts, and eosinophils. Phagocytosis is a fundamental process in immunity (26). The CRP test showed that Sappan wood ethanol extract reduced inflammation with a lower level than the infection condition (negative control). Along with an increase in the phagocytic index and a decrease in inflammation after the ethanol extract of Sappan wood treatment, the total leukocyte level gradually returns to normal after exceeding normal.

In this research, *Staphylococcus aureus* infection (negative control) shows that the phagocytic index is lower than the immune booster and treatment of Sappan wood. It is caused by the pathogenicity of *Staphylococcus aureus* and can decrease phagocytosis. The virulence factor of this bacteria causes this pathogen to attach to a tissue's cells, escape the host immune system, and have some factors that decrease phagocytosis, factors that interact with anti-staphylococcal antibodies, and factors that elaborate proteases, exotoxins, and enzyme in the immune system. *Staphylococcus aureus* is a pyogenic pathogen capable of tissue invasion and evasion of phagocytosis by neutrophils. Staphylococcal lipoteichoic acid is involved in the synthesis of inflammatory cytokines by monocyte/ macrophages (27). *Staphylococcus*

aureus can activate pro-inflammatory cytokines, including IL-6 and IL-8 (28).

The previous research showed that 25 mg/kg body weight of ethanol extract of Caesalpinia Sappan had immunomodulatory activity on the peritoneal macrophage of albino mice. It significantly enhanced the phagocytic activity of macrophages (18). Caesalpinia Sappan extracts dose-dependently inhibited the expression of proinflammatory cytokines IL-1β and TNF-α in IL-1β-stimulated chondrocytes and LPS-stimulated THP-1 macrophages (29). Some of the compounds in Sappan wood can act as immunomodulators, such as polyphenol, flavonoid, quercetin, brazilin, coumarin, episappanol, protosappanin C, brazilin, isoprotosappanin B, and sappanol.

This research shows that the ethanol extract of Sappan wood contains polyphenols and flavonoids. Polyphenol successfully isolated from Sappan wood is sappanchalcone, caesalpiniaphenol G, and quercetin (30). Polyphenols can increase phagocytosis and optimize macrophage function (31).

The previous research shows that levels of flavonoids in Sappan wood extract using the maceration method is 0.0539 % (32). The total flavonoid content correlates with the phagocytic capacity of macrophages (33). Flavonoids are also anti-inflammatory in several chronic diseases such as cancer, diabetes mellitus, cardiovascular disease, and neuroinflammation (34).

Quercetin is a type of flavonoid that has immunomodulatory activity. Quercetin promotes some gene expressions involved in phagocytoses, such as CORO1A, CYBA, LAMP1, RAB7A, RAC1, and PAK1 genes (35). In addition, quercetin inhibits the production of inflammation-producing enzymes such as cyclooxygenase (COX) and lipoxygenase (LOX), inhibits proinflammatory cytokine production against H_2O_2-induced inflammation, and suppresses many inflammatory pathways (36).

Brazilin, the major compound of Sappan wood, was reported to have anti-inflammatory. Brazilin suppressed the release of IL-1ß, TNF-α, NO, and PGE2, suggesting that these effects are mediated by Heme oxygenase-1. This result correlates well with studies on Caesalpinia sappan extract and brazilin in mouse macrophages, demonstrating that the potential anti-inflammatory effects of the agents involve the inhibition of PGE2 production (37).

Several compounds that have other immunomodulatory effects in Sappan wood include coumarin, episappanol, protosappanin C, brazilin, isoprotosappanin B, and sappanol. Coumarin increases phagocytosis activity. Episappanol, protosappanin C, brazilin, isoprotosappanin B, and sappanol significantly inhibited the secretion of the proinflammatory cytokines such as interleukin (IL-6) and tumor necrosis factor-alpha (TNF-α). Sappanol increased the secretion of the anti-inflammatory IL-10 (29).

CONCLUSION

In conclusion, Sappan wood ethanol extract significantly increases the phagocytic index and suppresses C-reactive protein (inflammatory acute-phase reactant). The phagocytic index and CRP level of 100 and 200 mg/kg body weight ethanol extract of Sappan wood were significantly different from the negative control (infection). This condition indicates the work of the immune system and inflammation was quickly completed so that the total leukocytes on the 7th day also gradually return to normal.

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ARTÍCULO ORIGINAL

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Family support and peer support related to the physical activity of the prospective bride and groom

Apoyo familiar y apoyo de pares relacionado con la actividad física de los futuros novios

Wiwit Kurniawati[1a], Yati Afiyanti[2a], Asa Akmelia[a], Neni Fidya Santi[b]

SUMMARY

Introduction: *Indonesia ranks third for maternal mortality rate (MMR) and second for infant mortality rate (IMR) in Southeast Asia. Weight management as a part of premarital preparation by the couple in welcoming the wedding day and life as spouses is usually done through physical activities or exercises. This study attempted to analyze the characteristics of the prospective bride and groom and the relationship between social support and physical activity done by the prospects.*
Methods: *This was a correlative descriptive study with a cross-sectional design conducted in Greater Jakarta. There were 239 prospective brides and grooms recruited by convenience sampling technique. The Social Support and Exercise Survey questionnaire measured family and peer support to identify the social support in physical activity. The global Physical Activity Questionnaire (GPAQ) was also used to determine each prospect's level of physical activity. Data were gathered through an online questionnaire. Data were analyzed using univariate and bivariate Chi-Square tests.*
Results: *The analysis showed a relationship between peer support and the prospective bride's and groom's physical activity (p-value = 0.003). Most respondents had sufficient support from family and peers and willingly carried out physical activities according to professionals' recommendations. On the other hand, the results also found a small proportion of prospective brides and grooms who have insufficient social support and physical activity.*
Conclusion: *It is recommended for health workers, especially nurses, to do various nursing interventions, such as promoting physical activity to peers or family with prospective brides and grooms to prepare for the physical condition of prospects before marriage properly.*

Keywords: *Physical activity, prospective bride and groom, social support.*

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RESUMEN

Introducción: *Indonesia ocupa el tercer lugar en tasa de mortalidad materna (MMR) y el segundo en tasa de mortalidad infantil (IMR) en el sudeste asiático. El control del peso como parte de la preparación prematrimonial de los novios para recibir el día de la boda y la vida en pareja se suele realizar a través de actividades físicas o ejercicios. Este estudio intentó analizar las características de los futuros novios y*

la relación entre el apoyo social y la actividad física realizada por los futuros novios.
Métodos: *Este fue un estudio descriptivo correlativo con un diseño transversal realizado en el Gran Yakarta. Hubo 239 posibles novias y novios reclutados mediante la técnica de muestreo por conveniencia. El cuestionario Social Support and Exercise Survey midió el apoyo familiar y de pares para identificar el apoyo social en la actividad física. También se utilizó el Cuestionario de actividad física global (GPAQ) para determinar el nivel de actividad física de cada prospecto. Los datos se recopilaron a través de un cuestionario en línea. Los datos se analizaron mediante pruebas de Chi-cuadrado univariadas y bivariadas.*
Resultados: *El análisis mostró una relación entre el apoyo de los compañeros y la actividad física de los futuros novios (valor p = 0,003). La mayoría de los encuestados tenía suficiente apoyo de familiares y compañeros y realizaba actividades físicas de acuerdo con las recomendaciones de los profesionales. Por otro lado, los resultados también encontraron una pequeña proporción de posibles novias y novios que tienen apoyo social y actividad física insuficientes.*
Conclusión: *Se recomienda que los trabajadores de la salud, especialmente las enfermeras, realicen diversas intervenciones de enfermería, como promover la actividad física entre pares o familiares con futuros novios para preparar adecuadamente la condición física de los futuros casados.*

Palabras clave: *Actividad física, futuros novios, apoyo social.*

INTRODUCTION

The mortality rate of mothers in Indonesia is still fairly high (1-3). According to Statistics Indonesia on maternal mortality ratio per 100 000 live births, there were approximately 305 deaths of women while pregnant and within 42 days of termination of pregnancy in 2015. Meanwhile, for the neonatal mortality ratio per 100 000 live births, there were approximately 32 deaths in 2017. Both ratios show a declining rate of mortality compared to the data from a year prior. Yet, Indonesia is still ranked with the third maternal mortality rate and second neonatal mortality rate in Southeast Asia (4). The health condition mostly influences these issues during preconception, the conception period, and after conception, yet the preconception period is the best period to prepare for pregnancy (5,6). During preconception, couples or prospective bride and groom can prepare everything to prevent or reduce the risk of maternal complications so that the baby can be delivered safely and healthy (7-9).

During the preconception preparation, the couple can carry out physical activities as a part of physical preparation (10). This is because physical activities are beneficial for maintaining weight loss, getting fit, and reducing the risk of infertility (11-15). However, in reality, it is found that people within Greater Jakarta are the most insufficient physically active while the proportion of obesity keeps increasing, yet the government had publicly released a campaign about the healthy life society movement.

Social bonding can influence the willingness to be physically active in physical activity since humans rely heavily on the social aspect. One effective mechanism in the social aspect is social support (16-19). Therefore, support from peers or family needs to be studied further in terms of its relationship with physical activity, so it can become another solution in the future in motivating the prospective bride and groom to prepare for their physical readiness. Moreover, the research on the characteristics of prospective bride and groom is not yet conducted widely, as well as the relationship between social support and physical activity. This issue motivated researchers to research prospective bride and groom as the subject, with the topic of the relationship between social support and physical activity in Greater Jakarta.

METHODS

A descriptive correlation with a cross-sectional study design was used in this research. The population of this study was prospective brides and grooms domiciled in Greater Jakarta. There were 239 prospective brides and grooms recruited by convenience sampling technique. Due to the pandemic of COVID-19, this research applied the convenience sampling technique in choosing the sample through the internet to reduce the risk of virus transmission. The online poster was also published through social media to gather the respondents. A total of 239 respondents were chosen and contacted one by one. The contact of each respondent was provided by Religious

Affairs Office in Greater Jakarta after being requested and granted by the office.

The Social Support and Exercise Survey questionnaire measured family and peer support to identify the social support in physical activity. Also, Global Physical Activity Questionnaire (GPAQ) was used to determine each prospect's physical activity level. The questionnaire also included age, height, weight or body mass index, sex, ethnicity, educational background, occupation, and average annual income. Data were processed and categorized by ordinal and nominal scales, then analyzed using univariate and bivariate chi-square tests. This study was approved by the Health Research Ethics Commission of the Faculty of Nursing, Universitas Indonesia (No. SK-211/UN2.F12. D1.2.1/ETIK 2020).

RESULTS

Among 239 respondents with a proportion of 31.4 % prospective groom and 68.6 % prospective bride, it was found that 89.5 % of respondents were early adults, 73.2 % were not overweight and obese, 12.1 % were overweight, and 14.6 % were obese. Moreover, most of the respondents come from Java ethnicity. In addition, 62.8 % of respondents had higher education, 75.7 % were employed, and 54.8 % had average income according to Jakarta's 2020 provincial minimum wage (Table 1).

Table 1

The Distribution of Prospective Bride and Individual Groom Characteristics within the Jakarta Metropolitan Area in 2020 (n=239)

Variable(s)	Frequency	Percentage (%)
Age		
Late adolescence	2	0.8
Early adulthood	214	89.5
Late adulthood	23	9.6
Body Mass Index		
Not overweight and obese	175	73.2
Overweight and obese	29	12.1
Obese	35	14.6
Sex		
Male	75	31.4
Female	164	68.6
Educational Background		
Primary education	4	1.7
Secondary education	85	35.6
Higher education	150	62.8
Employment status		
Unemployed	58	24.3
Employed	181	75.7
Income		
Low	108	45.2
Average	131	54.8
Total	239	100.0

For the social support variable in Table 2, this research used median data to determine the intercept point because the normality test results showed a non-normal distribution. According to both variables, family support, and peer support, it was found that respondents had already gained adequate support, in which 51 % of respondents gained adequate support from family compared to 49 % of others. Also, 52.3 % of respondents gained adequate peer support while other 47.7 % gained poorly. Moreover, the GPAQ questionnaire resulted in the average length of physical activity per week carried out while at work, while traveling, and at home. The data were analyzed further using MET scoring, which was later categorized as physically active (MET minutes per week ≥600) and insufficiently physically active (MET minutes per week < 600). The results found among 239 respondents that 69 % of respondents were physically active while 31 % of others were insufficiently doing physical activity. The Chi-Square test found a meaningless relationship between family support and physical activity ($p=0.291$; $\alpha=0.05$). However, peer support was found to have a meaningful relationship with physical activity ($p=0.003$; $\alpha=0.05$).

Table 2

Relationship between social support and physical activity on prospective bride and groom in Greater Jakarta (n=239)

Variable(s)	Physical activity			
	Active n (%)	Inactive n (%)	Total n (%)	X^2
Family support				0.291
Adequate	88 (36.8)	34 (14.2)	122 (51.0)	
Inadequate	77(32.2)	40 (16.7)	117 (49.0)	
Peer support				0.003
Adequate	97(40.6)	28(11.7)	125(52.3)	
Inadequate	68(28.5)	46(19.2)	114(47.7)	

DISCUSSION

The results show that the prospective bride and groom in Jakarta Metropolitan Area are dominated by the productive age group and, more specifically, the early adult age group. This is appropriate considering that the minimum age for marriage regulated in Indonesian legislation is 19 years old for both men and women. Moreover, at this stage of productive age, someone usually starts working to be more financially ready to start building a household compared to the younger age group.

The results also showed that the bride and groom in DKI Jakarta had a Body Mass Index (BMI) that did not fall into the category of overweight and obese. However, a study on body weight and health in early adulthood to mid-adulthood also found that weight gain was more prevalent in the early thirties to early fifties (20). This condition is related to the bride and groom's activities and the productive age to start working. Therefore, Bride-to-be, mostly in the productive age category, is dominated by early adulthood and the marriage preparation period, which may be a factor in the small BMI number.

The results of further research are the characteristics of respondents in terms of education, occupation, and income of the prospective bride and groom in DKI Jakarta. From these three individual characteristics, the study's results found that most prospective brides were highly educated (diploma, bachelor, master, specialist, doctorate), worked, and had an income that was in line with the provincial minimum wage DKI Jakarta in 2020. This is in line with government programs in which 9 years of study are compulsory and high levels of education also provide higher employment opportunities. This is following research which states that higher education tends to get more job opportunities (21). However, in terms of income, although most of the prospective brides earn according to the provincial minimum wage, some of the prospective brides' jobs during the research did not generate income that was in accordance with the DKI Jakarta provincial minimum wage even though the education they had taken was high. One possibility is that the job the bride and groom are doing is informal work and can also be affected by the pandemic.

Most brides and grooms in DKI Jakarta receive sufficient support in physical activities, both from their family and friends. Most of the prospective brides, both male and female, are also physically active according to the recommendations of physical exercise (30 minutes per day) or World Health Organization (WHO) (150 minutes/per week for moderate-intensity physical activity; or 75 minutes/per week for heavy-intensity physical activity; or 600 METs per week for both mixtures). These findings support the claim that having better social relationships has lower morbidity and mortality rates and is involved in healthier behaviours (22,23). Having other people provide emotional support or assistance can encourage, set an example, monitor change,

and provide assistance as needed. Knowing that someone cares and can help when needed is invaluable for sustaining behaviour change. Sharing ideas and goals, as well as feedback on the best approach to achieve them, is empowering and can effectively promote self-care behaviour with personal meaning, purpose, and a sense of belonging (16).

The study also showed that social support related to the physical activity found a significant relationship between peer support and physical activity for the bride and groom. Meanwhile, there is no relationship between family support. Abadini and Wuryaningsih's research (24) on 174 office workers with an age range of 21-58 years in DKI Jakarta also shows the same results; namely, friend support is related to physical activity of office workers ($p = 0.013$) while family support does not find a significant relationship ($p = 0.139$). Seeing this result, one of the factors that might influence is because more support from friends is obtained from both sexes, both by the prospective groom and the future bride. This is different from family support which the prospective bride only accepts. In addition, the bride and groom, who are in a productive period, most of their time is spent at work, so physical activities performed at work play a significant role in total physical activity per week, not physical activities in their spare time done with family.

CONCLUSION

The study found that peer support had a significant relationship with physical activity for the bride and groom; this is because the bride and groom, mostly early adults, have more physical activity while working. The study recommends making efforts to promote physical activity. For further research, it is suggested to be able to conduct research by adding the area, questions about individual characteristics related to first marriage or not, and directly going to the field, such as the regional health centers and or religious affair office, so that bias can be reduced. The results of this study are also expected to impact nursing services for prospective brides in Primary care. The nurse can play a role in educating about the benefits of physical activity in building a family and supporting the bride and groom to maintain and carry out physical activities with their closest people so that support in carrying out physical activity can be given to each other.

CONFLICT OF INTERESTS

The authors declare no conflict of interest.

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The effectiveness of mindfulness-based stress reduction on parental stress during COVID-19 pandemic: A randomized controlled trial

La eficacia de la reducción del estrés basada en la atención plena sobre el estrés de los padres durante la pandemia de COVID-19: Un ensayo aleatorio controlado

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SUMMARY

Introduction: *Parental stress during the COVID-19 pandemic causes a negative parenting response and impacts children's social-emotional development. This study aimed to analyze the effectiveness of Mindfulness-Based Stress Reduction (MBSR) on parental stress during the COVID-19 pandemic.*
Methods: *This study used a randomized controlled trial. A total of 32 participants were recruited and randomly divided into intervention and control groups. The intervention group received mindfulness-based stress reduction (MBSR) 8 sessions (one session a day for 40 minutes), while the control group got the same intervention after filling out the post-test. The parental stress index is used to measure the stress level of parents. Data were analyzed using Wilcoxon and Mann-Whitney tests.*
Results: *Participants in the intervention group showed a significant reduction in parental stress levels after receiving MBSR ($p<0.05$), as well as substantial differences in parental stress levels between the two groups ($p<0.05$).*
Conclusion: *Mindfulness-Based Stress Reduction (MBSR) reduced parental stress during the COVID-19 pandemic. Findings from the study suggest that MBSR can be carried out routinely on the sidelines of daily activities to reduce parental stress. Furthermore, it can be applied as nurses' independent intervention for reducing adult stress during the pandemic.*

Keywords: *COVID-19 pandemic, mindfulness-based stress reduction, parental stress, parents.*

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RESUMEN

Introducción: *El estrés de los padres durante la pandemia de COVID-19 provoca una respuesta parental negativa e impacta el desarrollo socioemocional de los niños. Este estudio tuvo como objetivo analizar la efectividad de la reducción del estrés basada en la atención plena (MBSR) sobre el estrés de los padres durante la pandemia de COVID-19.*

Métodos: *Este estudio utilizó un ensayo controlado aleatorio. Se reclutó un total de 32 participantes y se dividieron aleatoriamente en grupos de intervención y control. El grupo de intervención recibió 8 sesiones de reducción de estrés basada en atención plena (MBSR) (una sesión al día durante 40 minutos), mientras que el grupo de control recibió la misma intervención después de completar la prueba posterior. El índice de estrés parental se utiliza para medir el nivel de estrés de los padres. Los datos se analizaron utilizando las pruebas de Wilcoxon y Mann-Whitney.*

Resultados: *Los participantes del grupo de intervención mostraron una reducción significativa en los niveles de estrés de los padres después de recibir MBSR (p<0,05), así como diferencias sustanciales en los niveles de estrés de los padres entre los dos grupos (p<0,05).*

Conclusión: *La reducción del estrés basada en la atención plena (MBSR) redujo el estrés de los padres durante la pandemia de COVID-19. Los hallazgos del estudio sugieren que MBSR se puede llevar a cabo de forma rutinaria al margen de las actividades diarias para reducir el estrés de los padres. Además, se puede aplicar como intervención independiente de las enfermeras para reducir el estrés de los adultos durante la pandemia.*

Palabras clave: *Pandemia de COVID-19, reducción del estrés basada en la atención plena, estrés de los padres, padres.*

INTRODUCTION

Corona Virus Disease 2019 (COVID-19), caused by SARS-CoV-2, was declared a pandemic for the first time on March 11, 2020. The COVID-19 pandemic has resulted in high mortality and severe morbidity (1) emerging integrative or hybrid methods (I/HM. Unfortunately, COVID-19 has remained a problem since discovering a new version of concern, known as Omicron (B.1.1.529). At the beginning of November 2021, Omicron was found in Botswana. This case was reported by the World Health Organization (WHO) on November 24, 2021, and is being treated as a global public health emergency (2,3). The omicron variety is expected to be three times more contagious than the initial SARS-CoV-2 strain and perhaps even more so than the delta strain (4). Indonesia had documented 644 instances of the Omicron variety as of January 14, 2022, most of which came from tourists abroad (529 cases). The remaining instances (115) are local transmissions in Indonesia (5). Besides impacting health and the economy, this condition also affects education in Indonesia. Distance learning is an alternative solution implemented during the pandemic, but many problems arise during the implementation of distance learning, such as human resources and technology that are considered unsupportive (6-9).

The government applies a period of enforcement of community activity restrictions levels 1-3 so that limited face-to-face learning can be carried out (6,10-12). On the other hand, the limited face-to-face learning policy is not much different from online learning, where parents still must accompany their children to study at home. This condition can also trigger parental stress (13-15) Most parents, especially mothers who work outside the home, find it challenging to help their children study at home. In addition, some parents cannot support their children in learning at home due to the lack of parental education and limited information technology tools (16).

The significant changes to daily family life caused by the pandemic can trigger parental stress and intrafamilial tension, leading to an increase in adverse childhood experiences (ACEs), including domestic violence, child abuse, and neglect (17-19). On the other hand, stressful life events and the negative emotions they generate can dysregulate the immune response by disturbing the sensitive interplay among the central nervous system (CNS), endocrine system, and immune system (20-22). In addition, parents with higher parental stress have worse psychological well-being, more negative and less positive effects (23), and lower marriage qualified field (24). Furthermore, children in families with higher parenting stress have more internalizing and externalizing problems, poorer cognitive skills such as executive function, and more social and interpersonal difficulties (24,25).

One way to manage parental stress is using mindfulness-based therapy, which consists of Mindfulness-Based Stress Reduction (MBSR) (26), and Mindfulness-Based Cognitive Therapy (MBCT) (27). Mindfulness therapy focuses on what is being experienced and tries to enjoy the process that is being experienced instead of shifting the mind to something else (28,29).

Several studies have investigated the effects of MBSR and mindful parenting therapies on parenting stress during the last decade. The decrease in parental stress after participating in the MBSR program was reported by parents of preschool-aged children with Autism Spectrum Disorder (ASD) and other developmental delays (30). In addition, the MBSR program has been shown to reduce parental stress, promote psychological well-being, and have good benefits on the child's primary outcome among ADHD children (31). However, many studies have examined the effectiveness of MBSR, and very few studies on blended MBSR training on parents of the primary school age group at the time of this study. This study aimed to analyze the effectiveness of Mindfulness-Based Stress Reduction (MBSR) on parental stress during the COVID-19 pandemic.

METHODS

A randomized controlled trial was conducted to assess Mindfulness-Based Stress Reduction (MBSR) to reduce parental stress during the COVID-19 pandemic from February until March 2022. The statistical population in this study were all parents of first-grade students at Anugrah Islamic Elementary School Surabaya in the academic year 2021-2022 who met the inclusion criteria. The inclusion criteria were a mother aged 26-45 years, internet access, participation in eight MBSR sessions, and completing the questionnaire. The exclusion criteria were history or current diagnosis of psychosomatic disease. Forty-three parents were selected as the study sample using simple random sampling and were randomly classified into two experimental groups and a control group (n = 16 per group). Furthermore, research assistants carried out randomization, and participants were assigned to groups with numbered papers.

The instrument in this study was a modified Parental Stress Index-Short Form (PSI-SF) (32), which was created by Abidin (33). This instrument was modified because there are differences in the meaning of the items from the perspective of various cultures (32). The Parental Stress Index assesses three aspects, including the parent domain, the child domain, and the parent-child interaction domain. These domains are combined to become a comprehensive, multidimensional measuring tool that can describe parenting stress. The construct includes the following elements: 1) Parent (depression, role restriction, sense of competence, social isolation, relationship with spouse, parental health), 2) Child (adaptability, demandingness, mood, irritability), and 3) Parent-child interaction (i.e., attachment, acceptability, reinforces parent). The parental stress scale is a five-category Likert scale with five options: Very Suitable (VS), Suitable (S), Uncertain (Ac), Unsuitable (U), and Very Unsuitable (VU). Because of the nature of the item, each statement had a scoring range of 1 to 5. (i.e., favourable or unfavourable). The high parental stress scale score revealed the severity of stress experienced by the parents and vice versa. The PSI validity and reliability test results showed that the valid item values ranged from 0.364 to 0.762 and were reliable (Cronbach's alpha 0.915). Parental stress criteria consist of mild (<72), moderate (72-102), and severe (>102) (32,34).

The intervention was carried out in eight sessions (twice a week), and each session was 40 minutes long. Offline sessions are held in the school room, while online sessions are held

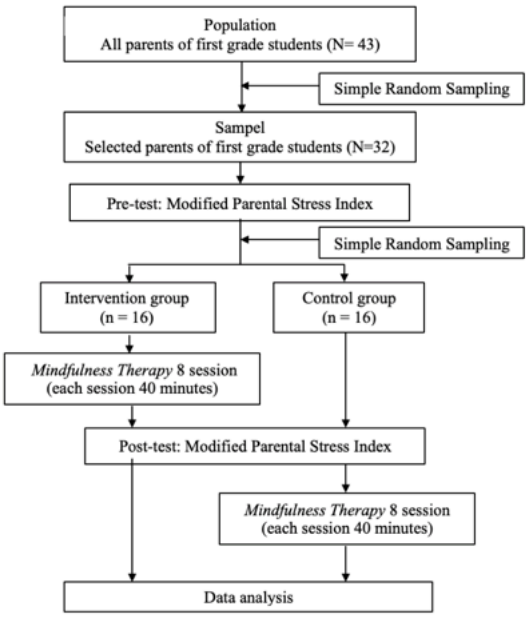

Figure 1. Recruitment and intervention flow.

through the Zoom meeting platform. This online intervention is carried out because there are face-to-face restrictions. All online sessions are recorded and sent via group chat so they can be reviewed by all participants. Table 1 summarizes the details of the program.

RESULTS

A total of 32 mothers participated in and completed the pre-test and post-test (Table 2). Most of the mothers were aged 26-35 years (71.9 %), high school senior education (68.8 %), and working (62.4 %). The results of the Chi-Square test showed that there was no significant difference in the characteristics of the participants between the two groups (p>0.05).

The results of the Wilcoxon test (Table 3) showed a significant change before and after eight sessions of MBSR were given to the intervention group (p=0.001). At the same time, there was no significant difference in the control group (p=1.00). The Mann-Whitney test showed a significant difference between the two groups after being given MBSR (p=0.0001).

Table 1

Content of Mindfulness-Based Stress Reduction (MBSR)

Week	Content	Implementation
1	Intro to mindfulness, breath, and body scan	Offline
2	Mindfulness, sitting meditation	Offline
3	Guided imagery	Online
4	Letting go and forgiveness	Online
5	Confidence and self-acceptance	Online
6	Lovingkindness meditation	Offline
7	Beginner's mind (mystery and miracle of life)	Online
8	Self-transcendence	Online

Table 2

Characteristics of Participants in This Study

Characteristics	Intervention Group		Control Group		Total	Test value	p-value
	n	%	n	%	n (%)		
Age						-0.382	0.705
26-35 years	12	37.5	11	34.4	23 (71.9)		
36-45 years	4	12.5	5	15.6	9 (28.1)		
Education						0.616	0.542
Junior High School	2	6.2	3	9.4	5 (15.6)		
Senior High School	11	34.4	11	34.4	22 (68.8)		
College	3	9.4	2	6.2	5 (15.6)		
Occupation						-0.309	0.76
Working	10	31.2	10	31.2	20 (62.4)		
Not working	6	18.8	6	18.8	12 (37.6)		

Table 3

Stress Level Difference Between Intervention and Control Group

Stress Level	Intervention Group		Control Group		p-value
	Pre n (%)	Post n (%)	Pre n (%)	Pre n (%)	
Low	0 (0)	0 (0)	3 (18.8)	3 (18.8)	
Moderate	7 (43.8)	13 (81.3)	8 (50)	8 (50)	0.0001**
High	9 (56.3)	3 (18.8)	5 (31.3)	5 (31.3)	
Total	16 (100)	16 (100)	16 (100)	16 (100)	
p-value	0.001*		1.000*		

*Wilcoxon Test **Mann-Whitney Test

DISCUSSION

Most mothers who participated in this study were of working and productive age, having dual roles as mothers and workers. In addition, mothers must also assist their children in studying from home. Since the COVID-19 pandemic policy where family members stay at home, including children, there are several concerns for parents, especially mothers, such as the number of school assignments, understanding of learning materials, family health, and family finances (16). Mothers of productive age and working are prone to experiencing stress, especially during the COVID-19 pandemic; mothers must face various problems ranging from work and finances to teaching children to do school assignments and report them daily. Moreover, mothers are also required to understand learning materials at school.

This study aimed to investigate whether blended MBSR training had any effect on reducing parental stress during an 8-session program. The results showed a decrease in parental stress in the intervention group. MBSR is part of mindfulness-based interventions (MBI), and one study demonstrated online MBI to be effective in reducing psychological distress and the possible mediating role of emotion regulation (35). In addition to conducting face-to-face interventions, several MBSR sessions were conducted online, considering the high incidence of Omicron COVID-19. A systematic review showed online mindfulness also had a positive effect. In times of uncertainty, turmoil, and distress, online mindfulness programs may help improve psychological health. These therapies temporarily improve state function (e.g., lowering pandemic-induced anxiety levels) (36). Online mindfulness programs for stress management have also been shown to reduce stress in Americans (37). Online mindfulness programs are also effective for pregnant women to teach them how to tolerate discomfort and cope with negative emotions by teaching them how to monitor their attention and accept what they are feeling. The findings suggest that an online mindfulness intervention could be a promising technique for teaching women how to use mindfulness skills to reduce depressive and anxious symptoms (38). There was no difference in effectiveness between the MBSR administered face-to-face or online, as both positively affected the participants. It may be because the material provided is following the standard operating procedure.

Even when the favorable effects are being investigated, MBIs are widely used as therapeutic techniques. Nyklcek and Kuijpers (39) used a randomized waitlist-controlled trial to implement the MBSR intervention among disturbed people. The study's goal was to see if mindfulness mediated the effects of MBSR on stress, vital exhaustion, positive and negative impact, quality of life, mindfulness, and daily mindfulness. MBSR usually starts with a body scan. Participants are instructed to pay attention to different areas of their bodies (from toe to head or otherwise) and feel the feelings that occur for

40-45 minutes without judging or modifying them. The following exercise is mindful yoga, designed to awaken attentive consciousness while watching the body gently. The effectiveness of MBSR against stress is also seen in the elderly with dementia. In addition, MBSR can reduce stress and improve mental health among caregivers of dementia patients who live in the community (40).

MBSR also includes sitting, walking, and lovingkindness meditation. While sitting, this practice involves paying attention to the flow of breath. Then, participants are guided to gradually shift their attention to other broader parts of the practice, including sounds, emotions, and ideas. Walking meditation is the next exercise, which is similar to the other meditation techniques. Participants must, however, feel the physiological feelings of walking in this situation. The final practice is lovingkindness meditation, in which participants pay attention with kindness and compassion to various things as well as all beings. This practice is seen as a key component of the MBSR program's adaptations for different objectives. Furthermore, rather than relying solely on formal mindfulness exercises during sessions, MBSR encourages clients to do informal mindfulness exercises every day (41,42). The three meditations in MBSR have their respective meanings and functions, so participants must focus and enjoy the meditation process. The participants will feel the positive effects if the meditation process is carried out correctly.

The participants were given the freedom and flexibility to tell their experiences after each meditation practice to express their feelings, thoughts, and body sensations. These findings follow the other study's results that the interaction between participants allows a process of helping each other, providing support, and showing a model of healthy behaviour so that anxiety in coronary heart disease patients decreases (43). Mindfulness intervention can also be combined with spiritual care, which has been proven to reduce public anxiety as an impact of the COVID-19 pandemic. Mindfulness meditation is the independent practice of healthcare professionals, individuals, and the general public for dealing with stress and anxiety during the COVID-19 crisis (44).

There are study limitations to note. First, the sample size is small, so it cannot be generalized to children with different developmental stages. Therefore, further research needs to be done to determine whether the results can be generalized to parents of children with various developmental periods (e.g., infants, preschoolers, adolescents). Second, this study did not measure effect size because the data scale used was ordinal, so we could not measure the strength of the MBSR effectiveness correctly. Future research is expected to measure the effect size of MBSR to know its effectiveness's power. The use of a larger sample is also likely in future research so that it can represent the population.

CONCLUSION

The findings of this study indicate that the blended 8-session MBSR program (twice a week) with a duration of forty minutes is proven to reduce stress for parents with school-age children. Therefore, MBSR is expected to be one of the independent interventions of nurses in dealing with parental stress so that it can improve the welfare of parents so that it does not have an impact on the parenting process and mental health of their children.

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Impact of diabetes self-management education in middle-aged patients with type 2 diabetes mellitus: A systematic review

Impacto de la educación para el autocontrol de la diabetes en pacientes de mediana edad con diabetes mellitus tipo 2: una revisión sistemática

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SUMMARY

Introduction: *Diabetes Mellitus (DM) disease, if not treated properly, will cause various complications. Entering the age of 40 years and above, patients with DM disease begin to show progress toward the occurrence of complications. Hence, DM patients need to know about the appropriate self-management of diabetes through diabetes self-management education (DSME). This systematic review aimed to identify the effectiveness of diabetes self-management education in middle-aged patients (40-64 years) with type 2 DM.*
Methods: *The research method used was a systematic review. A literature search was conducted on data based on Scopus, Web of Science, PubMed, and EBSCO with the keyword's education, self-management, diabetes mellitus, self-care, and middle-aged. As a result, there was 15 literature that met the inclusion criteria, including type 2 DM patients, diabetes self-management educational interventions, the output is glycemic control (fasting blood sugar levels, post-prandial 2-hour blood sugar levels, and HbA1c levels), quality of life, self-efficacy, blood pressure, psychological status, and self-care behaviours.*
Results: *The results showed that the impact of diabetes self-management education on type 2 DM patients improved quality of life, controlled blood pressure, increased self-efficacy, psychological status, and self-care behaviour.*
Conclusion: *The conclusion is that interventions in the form of diabetes self-management education have a positive impact on middle-aged patients with type 2 DM, and this intervention can be applied in healthcare settings. Subsequent studies with other methods and designs of study, as well as a greater amount of literature, are strongly recommended.*

Keywords: *Education, diabetes mellitus, diabetes mellitus type 2, self-management.*

RESUMEN

Introducción: *La enfermedad de la diabetes mellitus (DM), si no es tratada adecuadamente, ocasionará diversas complicaciones. Al entrar en la edad de 40 años o más, los pacientes con enfermedad de DM comienzan a mostrar progreso hacia la aparición de complicaciones. Por lo tanto, los pacientes con DM necesitan conocer el autocontrol apropiado de la*

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diabetes a través de la educación para el autocontrol de la diabetes (DSME). Esta revisión sistemática tuvo como objetivo identificar la efectividad de la educación para el autocontrol de la diabetes en pacientes de mediana edad (40 a 64 años) con DM tipo 2.

Métodos: *El método de investigación utilizado fue una revisión sistemática. Se realizó una búsqueda bibliográfica sobre datos basados en Scopus, Web of Science, PubMed y EBSCO con las palabras clave educación, autogestión, diabetes mellitus, autocuidado y mediana edad. Como resultado, hay 15 publicaciones que cumplen con los criterios de inclusión, que incluyen pacientes con DM tipo 2, intervenciones educativas para el autocontrol de la diabetes, el resultado es el control glucémico (niveles de azúcar en sangre en ayunas, niveles de azúcar en sangre posprandiales a las 2 horas y HbA1c niveles), calidad de vida, autoeficacia, presión arterial, estado psicológico y conductas de autocuidado.*

Resultados: *Los resultados mostraron que el impacto de la educación para el autocontrol de la diabetes en pacientes con DM tipo 2 mejoró la calidad de vida, controló la presión arterial, aumentó la autoeficacia, el estado psicológico y el comportamiento de autocuidado.*

Conclusión: *La conclusión es que las intervenciones en forma de educación para el autocontrol de la diabetes tienen un impacto positivo en pacientes de mediana edad con DM tipo 2, y esta intervención puede aplicarse en entornos de atención médica. Se recomiendan estudios posteriores con otros métodos y diseños de estudio, así como una mayor cantidad de literatura.*

Palabras clave: *Educación, diabetes mellitus, diabetes mellitus tipo 2, autocuidado.*

INTRODUCTION

Diabetes Mellitus (DM) is caused by an increase in blood glucose levels over a long period and, if not treated properly, can cause various complications (1-3). Efforts to prevent complications can be made in various ways, for example, by increasing the knowledge of DM patients. Efforts to prevent complications can be made in various ways, for example, by increasing the knowledge of DM patients through education to improve the ability of patients to manage their diseases (4-7). Health workers have carried out various education, but it is felt that it is not optimal. This condition is evidenced by the data that some patients come to the service already with various complications. This condition is caused due to poor glycemic control due to low adherence to treatment and self-care behaviour (8-10). DM is also a chronic disease that requires regular treatment, so it is not uncommon to cause psychological stress in patients (11-13). It is further explained that stress affects the patient's emotions and impacts non-compliance with treatment (14).

Currently, the number of DM patients, primarily type 2 DM, is increasing rapidly (15). The number of DM people in the world for 2021 is 537 million. This number is predicted to increase to 643 million in 2030 and 783 million in 2045 (16). Type 2 DM is a direct cause of approximately 1.5 million deaths globally. Patients with type 2 DM face a much higher risk of morbidity and mortality, directly impacting the declining quality of life and productivity (17). Type 2 DM was also associated with a 3-fold increase in deaths, primarily associated with cardiovascular disease, and a 3 to 7-fold increase in the risk of coronary artery disease (15). This condition certainly significantly impacts reducing the quality of life of type 2 DM patients.

Quality of life is one of the most important factors for treatment outcomes to assess the influence of diabetes management. It is influenced by several factors, including personal expectations, attitudes, practices, and patient knowledge (18). The low quality of life of DM patients is oft en associated with the presence of DM complications. It is further explained that DM complications such as cardiovascular disease, nephropathy, renal failure, erectile dysfunction, amputations, and infections impact health and negatively influence the quality of life (19,20). Patients with DM also tend to have a poor quality of life, especially regarding physical and psychological functioning (21). Therefore, efforts to prevent complications are significant, one of which is through diabetes self-management education.

Diabetes self-management education is a diabetes support program that is a means for DM patients to get an education, support the development of patient health and shape the behaviour of diabetic patients (22). Diabetes self-management education is carried out to produce clinical changes in DM patients (controlled blood glucose levels) and changes in lifestyle and

psychosocial in type 2 DM patients (23). Another opinion explains that diabetic patients that gain sufficient knowledge through education, it is hoped, will be able to carry out self-care properly to achieve adequate glycemic control. Various complications can be minimized and prevent premature death (24). Several research results show that diabetes self-management education impacts increasing self-efficacy, decreases HbA1c levels, controlling blood pressure, and increases self-care behaviours (25-27). This condition shows that diabetes self-management education positively impacts type 2 DM patients. However, in this literature review, we want to know more deeply about the influence of diabetes self-management education, especially in middle adulthood, because considering it is at this age that the development of DM disease occurs with various microvascular complications and macrovascular. Based on the above phenomenon, a more in-depth study of the literature on the effectiveness of diabetes self-management education in middle adult patients with type 2 DM needs to be carried out. This systematic review aims to test the effectiveness of diabetes self-management education in middle-aged patients with type 2 DM. This study aimed to illustrate the effectiveness of diabetes self-management education in middle-aged patients with type 2 DM.

METHODS

Study Design

The design of this study is a systematic review. The literature used in this study is a research article that discusses diabetes self-management education and its impact on middle-aged patients with type 2 DM.

Sample Study

Inclusion criteria in this study were participants diagnosed with type 2 DM in a middle adult age range (40-64 years). Type 1 DM or other types, ages under 40 or over 65, are excluded. The interventions provided were diabetes self-management education (dietary regulation, physical activity, drug regulation, blood sugar level monitoring, and foot care) for type 2 DM patients. Other interventions that are not related to the self-management of diabetes are excluded. The main results expected in this paper are glycemic control (HbA1c levels), and secondary results are quality of life, self-efficacy, blood pressure, psychological status, and self-care behaviour. Other inappropriate outcomes, such as knowledge and attitudes, are excluded.

Search Methods for Identifying Studies

The literature search was carried out on 4 (four) data based, namely Scopus, Web of Science, PubMed, and Ebscohost (CINAHL), from 2017 to 2021. The Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) guidelines are used to conduct and report on systematic reviews. The search strategy is carried out with several stages, including entering keywords to see articles relevant to the research. Next is to check the duplication between the database and output the duplicated article, then read the title and abstract. The next step is to adjust to the established inclusion and exclusion criteria. In the end, they got the full article from article and found 15 articles eligible for systematic review. The search flow chart is in Figure 1.

Study Selection

Study selection is carried out manually against articles that are for the study. Articles that do not fit the purpose of the study are issued. In the event of duplication of articles, then the duplicated articles are excluded. Furthermore, screening titles and abstracts relevant to the research objectives are carried out. In the end, there are identified articles that are ready for review.

Data Extraction

The authors filtered all abstracts identified in the initial search and issued studies that did not fit the inclusion criteria. The data extraction process is carried out by collecting data related to the author, year of publication, study design, basic sample, final size, and duration of intervention. After the data extraction process, it is reviewed again by all authors to see the accuracy of the data.

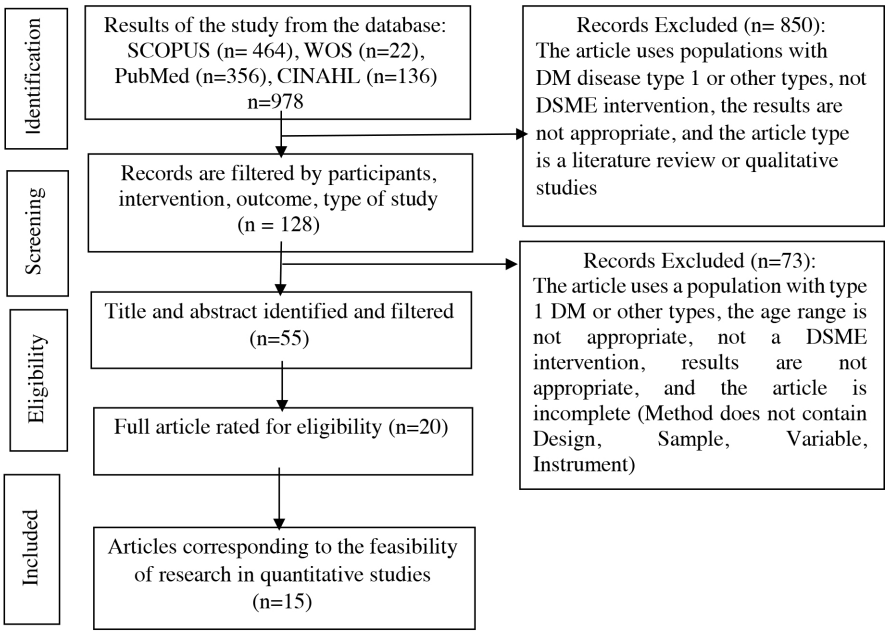

Figure 1. Flow chart of study selection.

Assessment of The Quality of The Study

The guide used to assess the quality of study methodology by reducing the risk of bias in this systematic review is Cochrane. The instrument uses specific criteria for assessment as low-risk, unclear, or high-risk across seven categories, including randomly sequenced, concealment of allocations, blinding participants and personnel, blinding result assessors, incomplete outcomes data, selective reporting of results, and other biased categories covering other areas of concern but not covered in the previous six categories.

RESULTS

The study's results are a literature review of the effectiveness of diabetes self-management education in type 2 DM patients. The results of this study are displayed following the categories that have been carried out: the effectiveness of diabetes self-management education on glycemic control, quality of life, self-efficacy, blood pressure, psychological status, and self-care behaviour. In addition, a literature study of 15 articles showed that diabetes self-management education positively affects the healthy development of type 2 DM patients.

DSME and Glycemic Control

Type 2 DM patients with poor management cause uncontrolled blood glucose levels, resulting in various complications. Glycemic control can be derived from several indicators, one of which is HbA1c levels. Several research results showed that diabetes self-management education improved the glycemic control of type 2 DM patients, where HbA1c levels decreased in the intervention group after being educated for 6 months (11). This study aims to evaluate the effectiveness of diabetes self-management education on the psychological and glycemic control of type 2 DM patients. The study involved 118 type 2 DM patients (63 intervention and 55 control group patients). The research design used is quasi-experimental.

Furthermore, the results of other studies illustrated that the decrease in HbA1c levels was greater in the group that received DSME by Japanese doctors and nurses' associations

Table 1. The Results of The Article Review.

Title, Author, Year	Research Objectives	Design	Sample	Results and Conclusions
The effect of diabetes self-management education on psychological status and blood glucose in newly diagnosed patients with diabetes type 2, (11)	Evaluating the effectiveness of diabetes self-management education on psychological outcomes and glycemic control in patients with type 2 diabetes mellitus	Quasi-experimental	118 type 2 DM patients (63 intervention/ education group patients and 55 control group patients)	There were differences in anxiety levels, depression, fasting blood sugar levels, 2-hour PP blood sugar levels, and HbA1c levels between the intervention and control groups after the intervention for six months.
Effects of physician's diabetes self-management education using Japan Association of Diabetes Education and Care Diabetes Education Card System Program and a self-monitoring of blood glucose readings analyzer in individuals with type 2 diabetes: An exploratory, open-labeled, prospective randomized clinical trial (28)	Identifying the effect of diabe-tes self-management education by doctors using educational tools on the glycemic control of type 2 DM patients in Japan	An exploratory, open-labeled, prospective ran-domized clinical trial	76 type 2 DM patients (38 intervention group patients and 38 control group patients)	HbA1c levels increased significantly in the intervention group, and there was no improvement in the control group. The decrease in HbA1c levels was more significant in the group that received the DSME of a Japanese doctor and treatment association than those who checked blood glucose levels and received insulin therapy.
Effectiveness of Diabetes Self–Management Education in Thais with type 2 Diabetes (29)	Identifying the educational effects of diabetes self-management in type 2 DM patients in Thailand	A retrospective cohort study	488 patients took the DSME, and 488 patients did not attend the DSME program	There was a similar reduction in HbA1c levels between the two groups. There was an increase in the knowledge and self-care behaviours of diabetes in the intervention group.
Effects of an Outpatient Diabetes Self-Management Education on Patients with type 2 Diabetes in China: A Randomized Controlled Trial (1)	Assess the effectiveness of diabetes self-management education programs in outpatient units.	A randomized controlled trial.	60 type 2 DM patients were divided into two groups (30 intervention group samples and 30 control group samples)	There were differences in the average SDSCA score ($p < 0.01$), dietary control (p value=, physical activity, psychological distress ($P<0.05$), foot care ($p < 0.01$), fasting blood sugar levels ($p < 0.01$), 2 hours PP ($p < 0.01$) and HbA1c levels ($p < 0.01$) in the intervention group before and after the procedure was given.
Examining elevated blood pressure and the effects of diabetes self-management education on blood pressure among a sample of Marshallese with type 2 diabetes in Arkansas (30)	Evaluated the effects of DSME on blood pressure in native Hawaiians and Pacifics.	Randomized controlled trial	221 patients with type 2 DM	There was a decrease in systolic blood pressure after the DSME intervention, and a significant decrease in diastolic blood pressure occurred six months and 12 months post-intervention.
Effect of diabetes self-management education on glycaemic control among type 2 diabetic patients at a family medicine clinic in Kenya: A randomized controlled trial (31)	Assess the educational influence of diabetes self-management compared to regular diabetes care by family doctors.	Randomised controlled clinical trial	96 patients of type 2 DM (55 patients of the DSME group) and 41 patients (ordinary group)	After six months of intervention, there was no significant difference from the main results, namely HbA1c levels between the two groups, with an average difference of 0.37. The DSME also makes no significant changes in the secondary output
Impacts of self-management education on glycaemic control in patients with type 2 diabetes mellitus (32)	Identifying the impact of dia-betes self-management education on glycemic control of type 2 DM patients after three months of intervention	A Double-arm post-test intervention study	45 type 2 DM patients (22 people in the experiential group and 23 people in the control group)	Lower glucose levels were found in the intervention group than in the control group. No substantial changes were seen in HbA1C levels.
A 2-Hour Diabetes Self-Management Education Program for Patients With Low Socioeconomic Status, Impr patients With Low Socioeconomic Status, Improves Shor es Short-Term Glycemic Control (33)	Determining the effectiveness of diabetes self-management education on glycemic control	A retrospective cohort study	94 type 2 DM patients	HbA1c levels decreased from 9.8% to 8.3% at an average of 4 months after participating in the Diabetes Self Management Education ($P<0.001$) program.
The effect of structured diabetes self-management education on type 2 diabetes patients attending a Primary Health Center in Kuwait (17)	Evaluated the impact of diabe-tes self-management education (DSME) on glycemic control measured by glycated haemoglobin (HbA1c) in patients with type 2 diabetes mellitus (T2DM) in Kuwait.	Single-center, controlled study.	291 type 2 DM patients (150 intervention groups and 141 control groups).	Patients who received DSME sessions showed better glycemic control (a decrease in HbA1c levels by 1.3% in the intervention group, while in the control group by 1.1%) with a p-value of < 0.001.
Efficacy of a self-management education program on patients with type 2 diabetes in primary care: A randomized controlled trial (26)	Assessing the effectiveness of diabetes self-management education on self-confidence and HBA1c levels of type 2 DM patients in the Spanish region	Randomized controlled trial	594 type 2 DM patients were divided into two groups (297 intervention and 297 control groups).	There was no difference in HbA1c levels in the intervention and control groups (p value= 0.307). There was an increase in self-efficacy (p-value = 0.018) after diabetes self-management education.

(continue on page S1188).

Table 1. The Results of The Article Review. (continue from page S1187).

Title, Author, Year	Research Objectives	Design	Sample	Results and Conclusions
Self-management education may improve blood pressure in people with type 2 diabetes. A randomized controlled clinical trial (34)	Identifying the effect of diabe-tes self-management education on clinical outcomes (blood pressure) and psychology of type 2 DM patients	Randomized controlled clinical trial	50 patients (25 intervention group patients and 25 control group patients)	Diabetes self-management edu-cation can control blood pressure, but no significant differences were found between the intervention and control groups.
The Effect of Modified Diabetes Self-management Education and Support on Self-care and Quality of Life among Patients with Diabetic Foot Ulcers in Rural Area of Indonesia, 2021 (35)	Determining the effectiveness of modified diabetes self-management education on self-care, the severity of diabetic foot injuries, and the quality of life in rural Indone-sia	A quasi-experimental design with pre-test and post-test control group design	60 type 2 DM patients (30 intervention group patients and 30 control group patients).	1). The degree of diabetic leg injury improved by 3.3%; 2) diabetic foot self-care behaviour scores increased by 8.8% and 3). quality of life increased by 32.7% points. These three indicators increased in the interven-tion group compared to the control group.
Effectiveness of a community-based diabetes self-management education (DSME) program in a rural agricultural setting (36)	Assessing the effectiveness of diabetes self-management education in rural agriculture	Prospective, education-intervention trial	155 patients (85 got DSME and 70 got standard care)	The DSME group had a lower HbA1C median after three and six months. After six months, there was a 0.5% reduction in median HbA1C levels in the DSME group and a 0.25% increase in the standard group. More participants in the DSME group had A1C ≤7.0% after three and six months.
Effectiveness of diabetes self-management education via a smartphone application in insulin-treated type 2 diabetes patients – design of a randomized controlled trial (37)	Evaluating the effectiveness of diabetes self-management education through a smartphone application in T2DM patients using insulin therapy	Randomised controlled trial	228 type 2 DM patients were divided into two groups (114 intervention groups and 114 control groups)	HbA1c levels were controlled after six months in the intervention group (HbA1c values ≤ 53 mmol/mol)
The impact of a self-management education program coordinated through WhatsApp on diabetes control (38)	Assess the effect of diabetes education programs through WhatsApp on hemoglobin glycosylation (HbA1c).	Randomized, two-arm parallel interventional study.	Two hundred eighteen patients were divided into two groups (109 people in the intervention group and 109 people in the control group).	There was a significant decrease in HbA1c levels in the intervention group (p value= 0.001) and not significant in the control group.

than in those who checked blood glucose levels themselves and received insulin therapy (39). Therefore, this study aims to identify the effect of diabetes self-management education by doctors using educational tools on the glycemic control of type 2 DM patients in Japan. The results of this study are not in line with two studies that show a similar reduction in HbA1c levels between the two groups (29). The research design was A retrospective cohort study involving 488 patients who followed DSME and 488 patients who did not follow the DSME program. This study was supported by one study that showed no difference in HbA1c levels in the intervention and control groups with a p-value of 0.307 (40).

Glycemic control is one indicator to assess type 2 DM patients' effectiveness in carrying out diabetes treatment. One of the study's results showed differences in HbA1c levels before and after DSME intervention was given in the intervention group (1). The study is in line with one of the studies involving 291 type 2 DM patients (150 people were involved in the intervention group, and 141 people were included in a control group). The research design used is a single-center controller study. The results of the study illustrated that patients who received DSME sessions showed better glycemic control (there was a decrease in HbA1c levels by 1.3 % in the intervention group, while in the control group by 1.1 %) with a p-value < 0.001 (17).

Furthermore, it was explained in a study that there was a decrease in HbA1c levels from 9.8.% to 8.3 % on an average of 4 months after participating in a diabetes self-management education program (33). Another study also found that HbA1c levels were controlled after 6 months in the intervention group with HbA1c values ≤ 53 mmol/mol (37). This study was supported by one study that showed that the DSME group had a lower HbA1c median after three and six months, whereas in the intervention group, there was a median reduction of 0.5 %, and many participants in the DSME group with HbA1c levels < 7.0 %, while in the control group there was an increase of 0.25 % (36). This study is similar to a study involving 218 Type 2 DM patients using a Randomized Controlled Trial design, illustrating a significant decrease in HbA1c levels in the intervention group with a p-value of 0.001 (38). However, the results of

this study are not in line with two studies that show no significant difference in HbA1c levels between intervention and control groups (31) (32).

DSME and Quality of Life

DM disease is a metabolic disease that requires long-term treatment and treatment so that it can have an impact on the quality of life of type 2 DM patients. Therefore, type 2 DM patients need education about diabetes management so that patients can do self-care and prevent various complications, thus improving their quality of life. Several studies have shown that DSME effectively improves the quality of life of type 2 DM patients. For example, one study showed that diabetes self-management education could improve the quality of life of type 2 DM patients by 32.7 % points. This study aims to determine the effectiveness of modified diabetes self-management education on self-care, the severity of diabetic foot injuries, and the quality of life in rural Indonesia. This study involved 60 type 2 DM patients divided into groups (30 intervention group people and 30 control group people). The design used was A Quasi-experimental design with a pre-test and post-test control group design (35).

DSME and Self-Efficacy

Self-efficacy is a belief in the ability possessed by a person to act. Type 2 DM patients need good self-efficacy to perform DM self-care in this case. It is further explained that self-efficacy is a major indicator of behaviour change and a major factor in controlling chronic diseases. Several literature reviews showed that the self-efficacy of type 2 DM patients increased after being given diabetes self-management education. One of the results showed an increase in self-efficacy with a p-value of 0.018 after being given diabetes self-management education (40). This study aims to examine the effectiveness of diabetes self-management education on self-efficacy and HbA1c levels of type 2 DM patients in Spain. The study involved 594 type 2 DM patients divided into two groups (297 belonged to the intervention group and 297 belonged to the control group). This study aims to examine the effectiveness of diabetes self-management education on the self-confidence of type 2 DM patients in Spain. The research design used was a Randomized Controlled Trial. In this study, type 2 DM patients received intervention for 12 months, and the impact was an increase in self-efficacy.

DSME and Blood Pressure

Individuals with DM disease risk developing hypertension (high blood pressure). Therefore, strong management is needed to prevent complications, one of which is hypertension. The literature study showed that type 2 DM patients who received diabetes self-management education experienced a decrease in blood pressure. One study showed a decrease in systolic blood pressure after 6 months and 12 months after the diabetes self-management education intervention. The study involved 221 type 2 DM patients. This study aims to evaluate the effect of DSME on the blood pressure of indigenous Hawaiians and the Pacific. The research design used is a Randomized Controlled Trial (30).

Based on the literature review results, a similar study was found involving 50 type 2 DM patients (25 intervention group patients and 25 control group patients). This study aims to identify the effect of diabetes self-management education on clinical outcomes, namely blood pressure. The research design used was a Randomized Controlled Trial. The study's results illustrated that diabetes self-management education could control blood pressure, but no significant difference was found between the intervention and control groups. In this study, the intervention group was educated and evaluated after four years, and it was proven that blood pressure was controlled (34).

DSME and Psychological Status

DM disease can affect the psychology of people with DM. This condition is caused because DM is a chronic disease that requires proper and comprehensive treatment, so it is not uncommon to cause a feeling of saturation, anxiety, and stress which has an impact on decreasing adherence to treatment and treatment. The results of a literature review from one of the studies showed

differences in the level of anxiety and depression between the intervention and control groups after being given diabetes self-management education for 6 months. This study aims to evaluate the effectiveness of diabetes self-management education on the psychological outcomes of type 2 DM patients. The study also involved 118 type 2 DM patients (63 people belonged to the intervention group and 55 people belonged to the control group). The research design used is Quasi-experimental (11).

A literature review of the impact of DSME on psychological status was also found in a similar study on the effectiveness of diabetes self-management education for type 2 DM patients undergoing outpatient treatment in China. This study aims to assess the effectiveness of the diabetes self-management education program in the outpatient unit and involves 60 type 2 DM patients, divided into 2 groups, namely 30 people who are members of the intervention group and 30 people who are members of the control group. The research design used was a Randomized Controlled trial. In this study, the intervention group was given two sessions of education and regular education. The educational program for the intervention group consists of theory and practice. Theoretical learning uses various media, while practical learning uses individual models and practices. The results showed a difference in the average psychological distress score in the intervention and control groups after being given diabetes self-management education (1).

DSME and Self-Care Behavior

Patients with type 2 DM need to perform good self-care behaviours to achieve adequate glycemic control. The results of a literature review of several research results show that diabetes self-management education has a positive impact on self-care behaviour. One study on the effectiveness of self-management education for patients with type 2 DM in Thailand showed an increase in diabetic self-care behaviour in the intervention group (29). The results of this study are similar to one of the studies that found that there was a difference in the average self-care score (p-value < 0.01) which consisted of dietary control (p-value < 0.01), physical activity (p-value < 0.05, foot care (p-value = p value < 0.01). This condition shows the influence of diabetes self-management education on self-care behaviour (1). Furthermore, the results of a literature review from one of the studies on the effectiveness of diabetes self-management education showed that the self-care behaviour score increased by 8.8 %. This condition illustrates that diabetes self-management education positively affects self-care behaviour (35).

DISCUSSION

Impact of DSME on Glycemic Control of type 2 DM Patients

A study on the effectiveness of diabetes self-management education using a smartphone application showed differences in HbA1c levels in the intervention group and control group after being given diabetes self-management education for six months (37). These results were not in line with one of the studies that showed no significant difference in HbA1 levels between the intervention group and the control group, with a p-value of 0.307 (26,31). It was further explained that HbA1c levels tend to decrease in patients who already have an essential HbA1c value of around 7.4 – 10.4 %, or it can be concluded that patients with generally reasonable glycemic control will quickly experience a decrease in HbA1c levels after being given interventions compared to patients with poor glycemic control. The results of this study were supported by research on the effectiveness of diabetes self-management education in type 2 DM patients in Thailand. There was no significant difference in HbA1 levels between the intervention and control groups after being given education for two years. This result also illustrates that for patients who received diabetes self-management education, the achievement of HBA1c levels was the same as patients who only received regular care in the same hospital (29).

Glycemic control is essential in evaluating the impact of treating DM patients. Glycemic control includes 3 (three) essential aspects, namely fasting blood sugar levels, post-prandial blood sugar levels, and HbA1c levels (11). Based on the results of a study of several kinds of literature, it is explained that diabetes self-management

education positively impacts the glycemic control of type 2 DM patients. The results of a study on the effect of diabetes self-management education on blood glucose levels of patients who were newly diagnosed with type 2 DM found data that there was a difference in fasting blood sugar levels, 2 h post-prandial (PP) and HBA1c levels in the intervention group and control group after intervention for six months (11). This study's results align with one of the studies that found data that there were differences in HbA1c levels, fasting blood sugar levels, and 2 hours post-prandial (PP) in the intervention group and control group after two sessions of providing diabetes self-management education (1). This result was supported by another study that showed a decrease in HbA1c levels in the intervention group after the 4th year of the intervention compared to the control group (34). It was further explained that HbA1c levels increased significantly in the intervention group, and there was no increase in the control group (28). This study proves that diabetes self-management education affects HbA1c levels in middle-adult patients with type 2 DM. It is therefore suggested that to achieve effective diabetes self-management education, all hospitals need to be managed with diabetes care with diabetes nurses and multidisciplinary teams trained in diabetes self-management education and support. This HbA1 level can also be used as an indicator to predict the possibility of complications in type 2 DM patients, so the effectiveness of education with modifications to other aspects needs to be done to achieve adequate glycemic control so that various complications due to DM can be minimized.

Impact of DSME on The Quality of Life of type 2 DM Patients

DM disease can affect the quality of life of type 2 DM patients; in this case, it decreases health-related quality (41). Some research results show that poor glycemic control can decrease the quality of life; however, if the glycemic control is adequate, the quality-of-life increases. One study showed that the quality of life of type 2 DM patients with diabetic foot ulcers increased in the intervention group compared to the control group after diabetes self-management education (35). The results of this study are in line with research on the effect of diabetes self-management education on the quality of life of female patients with type 2 DM that there was a significant change in the quality of life in the group that received diabetes self-management education compared to the control group (42). This condition shows that diabetes self-management education effectively improves the quality of life of type 2 DM patients.

Impact of DSME on Self-Efficacy of type 2 DM Patients

The study results from the literature review showed an increase in self-efficacy in the intervention group compared to the control group after being given diabetes self-management education (26). Self-efficacy is an individual's assessment of his ability to organize and take action (43). It is further explained that self-efficacy is an individual's belief in his ability to display activities that affect his life, which is related to his ability to perform self-care (44). The research results from a literature review showed an increase in self-efficacy in the intervention group compared to the control group after being given diabetes self-management education (26). Self-efficacy is a crucial indicator of behaviour change. If type 2 DM patients have good self-efficacy, then DM patients can carry out self-care behaviours to prevent various complications.

Impact of DSME on Blood Pressure of type 2 DM Patients

The risk of hypertension increases in patients with type 2 DM, so various interventions must be carried out to improve patient adherence to treatment and treatment. One of the interventions provided is diabetes self-management education. The results of a literature review on the effect of diabetes self-management education on blood pressure showed that DSME intervention for six months could lower systolic blood pressure, and a significant decrease in diastolic blood pressure occurs after six months and 12 months post-intervention (30). Some research results also show that DSME effectively lowers the blood pressure of DM patients with hypertension. This statement is in line with one study that diabetes self-management education affects blood

pressure reduction in the intervention group. However, no significant differences were found between the intervention and control groups (34). The results of other studies showed that DSME intervention improved blood pressure in type 2 DM patients with a p-value < 0.001 (27). It was further explained that 9.1 % of patients showed blood pressure within the recommended limit of 130/80 mmHg. Therefore, it can be concluded that diabetes self-management education affects controlling blood pressure for type 2 DM patients. Therefore, educational interventions can be developed to prevent cardiovascular complications in type 2 DM patients.

Impact of DSME on The Psychological Status of type 2 DM Patients

Diabetes self-management education is considered to be able to reduce psychological stress in type 2 DM patients. This is illustrated by the results of the study that there were differences in the level of anxiety and depression between the intervention and control groups after educational interventions for six months (11). It was further explained that the anxiety score in the intervention group was compared to the control group (36.00 vs 42.50 with a p-value of < 0.05) and a depression score (35.55 vs 44 with a p-value of < 0.05). This study's results align with other studies that show differences in stress levels between the intervention group and the control group after being given a DSME intervention with a p-value of 0.007 (42).

A person with DM disease has the potential to experience psychological stress as a result of the presence of chronic diseases that require long-term treatment (45). It was further explained that individuals with diabetes have a high prevalence of experiencing depression and anxiety (4). Stressful conditions also cause the endocrine system to release excessive glucocorticoid hormones, disrupting glucose production in the liver and reducing insulin sensitivity which can cause hyperglycemia (46). The existence of diabetes self-management education has a positive impact on reducing psychological stress levels, so it needs to continue to be carried out by health workers and applied in various health service settings.

Impact of DSME on Self-Care Behaviour of type 2 DM Patients

Self-management education is a form of intervention provided so that patients can improve their knowledge and skills and have the self-confidence to do self-care (11). Several studies have shown the positive impact of diabetes self-management education on self-care behaviour. A literature review from one of the studies showed an increase in self-care behaviour in the intervention group after being given education (29). The results of this study were supported by a study on the effect of diabetes self-management education on type 2 DM patients in China that there was a difference in the average SDSCA score / Summary Diabetes Self Care Activity (p-value < 0.01) between the intervention group and the control group after being given education with details of dietary control (p-value < 0.01), physical activity (p-value < 0.01), treatment adherence (p-value > 0.05), foot care (p-value < 0.01) and monitoring blood sugar levels with a p-value of > 0.05 (1). The results of this study are also in line with other studies that education improves the practice of self-care behaviour in type 2 DM patients (47).

Self-care behaviour is a crucial indicator in improving glycemic control (29). Adherence to self-care will have an impact on controlling blood glucose levels. DM patients need to understand good self-management so that they have the ability and awareness to carry out self-care behaviours. Some of the results of this study illustrate that, in general, diabetes self-management education can affect self-care behaviour. It is further explained that several things need to be considered to improve the effectiveness of education to encourage patients to discuss the problems encountered, such as fear of performing insulin injections or teaching techniques used to inject insulin to increase physical comfort. This will also have a direct impact on adherence to treatment. Based on some of the descriptions and explanations above, it can conclude that diabetes self-management education positively influences the self-care behaviour of type 2 DM patients.

Limitations of the study

This systematic review used PRISMA guidelines to identify studies that included the educational impact of limited diabetes self-management in middle adult patients with type 2 DM, which has an impact on a lack of literature on the impact of diabetes self-management education on quality of life. Another limitation of this study is that some terms may be omitted as keywords in the initial search, thus hiding related studies.

CONCLUSION

Sixteen pieces of literature found that diabetes self-management education is one of the most effective interventions to improve glycemic control, self-efficacy, quality of life, controlled blood pressure, reduce psychological stress and improve self-care behaviour, especially in middle adult patients with type 2 DM.

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Factors of medication adherence among adult patients with tuberculosis: A literature review

Factores de adherencia a la medicación en pacientes adultos con tuberculosis: una revisión de la literatura

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SUMMARY

Introduction: *Medication adherence is a critical factor in the success of tuberculosis (TB) therapy. Many factors are related to TB medication adherence among TB patients in clinical and community services. This study aimed to identify the factors of TB medication adherence based on the Social-Ecological Model.*
Methods: *A literature review was carried out for this study. Articles published between 2016 and 2021 in three databases were included in this study. This study only targeted TB patients and assessed the determinants or factors related to tuberculosis medication adherence. Data were extracted using the Social-Ecological Model factors consisting of four levels: individual, relationship, community, and societal. A total of 17 articles were enrolled in this review.*
Results: *The results of the studies found that the determinants to improve medication adherence include four-level factors, including individual, relationship, community, and societal factors, to design the medication adherence program for tuberculosis patients.*
Conclusion: *Multiple and holistic factors influence TB medication adherence. It is crucial to assist TB patients in overcoming the barriers that can prevent patients from adhering to treatment.*

Keywords: *Determinants factors, medication adherence, tuberculosis.*

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RESUMEN

Introducción: *La adherencia a la medicación es un factor crítico en el éxito de la terapia de la tuberculosis (TB). Muchos factores están relacionados con la adherencia a la medicación antituberculosa entre los pacientes con tuberculosis en los servicios clínicos y comunitarios. Este estudio tuvo como objetivo identificar los factores de adherencia a la medicación para la TB a partir del Modelo Socio ecológico.*
Métodos: *Para este estudio se llevó a cabo una revisión de la literatura. En este estudio se incluyeron artículos publicados entre 2016 y 2021 en tres bases de datos. Este estudio se centró únicamente en pacientes con TB y evaluó los determinantes o factores relacionados con la adherencia a la medicación antituberculosa. Los datos se extrajeron utilizando los factores del modelo socio ecológico que consta de cuatro niveles: individual, relacional, comunitario y social. Un total de 17 artículos se inscribieron en esta revisión.*
Resultados: *Los resultados de los estudios encontraron que los determinantes para mejorar la adherencia a la medicación incluyen factores de cuatro niveles, que incluyen factores individuales, relacionales,*

comunitarios y sociales, para diseñar el programa de adherencia a la medicación para pacientes con tuberculosis.
Conclusión: *Múltiples y holísticos factores influyen en la adherencia a la medicación antituberculosa. Es crucial ayudar a los pacientes con TB a superar las barreras que pueden impedir que los pacientes se adhieran al tratamiento.*

Palabras clave: *Factores determinantes, adherencia a medicamentos, tuberculosis.*

INTRODUCTION

Tuberculosis (TB) is currently a health problem worldwide. World Health Organization (WHO) determined that pulmonary TB is a highly prevalent communicable disease, especially in developing countries (1,2). Pulmonary TB is the most common infectious disease and one of the leading global causes of mortality from infectious diseases (3-6). In addition, pulmonary TB is a threat because the cure rate is still low (2,7-9).

In 2020, an estimated 9.9 million patients will suffer from tuberculosis worldwide (127 per 100 000 population) (10). The major of tuberculosis cases geographically in 2020 reached 43 % occurred in Southeast Asia and Africa. The 30 nations with the highest incidence of TB accounted for 86 % of all estimated incident cases worldwide, with eight of these countries accounting for two-thirds of the global total (India, China, Indonesia, Philippines, Pakistan, Nigeria, Bangladesh, and South Africa) (4). TB was the 13th most prominent cause of death globally and the leading infectious agent-related cause. Globally, 1.3 million TB patients with HIV-negative persons died in 2020. And about 85 % of total tuberculosis deaths are from African and Southeast Asia regions, including Indonesia (4). In Indonesia, deaths caused by tuberculosis reached 93 000 per year, equivalent to 11 deaths per hour (11).

Adherence to TB treatment is vital to achieving a cure. Non-adherence to the treatments worsens TB conditions, increases infectiousness, initiates drug resistance, and can cause death (12-14). Non-adherence to TB treatment is the most significant obstacle to tuberculosis control globally. In addition, it contributes to treatment failure (12,15). In 2019, the global success rate of patients treated for tuberculosis with first-line regimens was 86 %, which is lower than the standard (90 %) (4). And about 40 % of patients in developing countries worldwide had poor adherence to TB therapy (13).

Based on the Directly Observed Treatment Short-course (DOTS) program, patients with tuberculosis typically required at least six months of therapy (16-18). Numerous TB patients experience recurring symptoms because of inadequate treatment procedures. Patients with TB frequently re-enter the hospital because their condition worsens (19). Many factors can affect the success of tuberculosis treatment. To investigate successful therapies, it is crucial to determine the various causes of non-adherence and identify those that are adjustable. Hence, finding a suitable model or theory to summarize the factors that affect medication adherence behaviour is necessary. The social-ecological model is one of the models that has been suggested to comprehend chronic disease adherence (20).

The social-ecological Model of health takes a comprehensive view and focuses on various variables that may influence health. According to the social-ecological model, health is affected by the interplay of the individual, the group/ community, and the physical, social, and political settings. The Canters for Disease Control and Prevention (CDC) developed a four-level model of health-related factors based on the social-ecological model, including individual, interpersonal, community, and societal (21). This literature review aims to summarize and identify the determinants related to TB medication using four-level of factors from the Societal-Ecological Model.

METHODS

A literature review was carried out for this study. This study extracted data from three databases (Scopus, EBSCO, PubMed) published between 2016 - 2021 and written in English publications. The articles used examined factors, determinants, and barriers related to compliance or adherence and loss to follow-up in the treatment of adult tuberculosis patients. The databases

search used the following terms (Determinants OR Factors) AND (Tuberculosis OR Tuberculosis Pulmonary) AND (Medication Adherence OR Patient Compliance) based on Medical Subject Headings (MeSH) terms. Both qualitative and quantitative research articles were included. However, only research articles were included that assess factors and determinants affecting tuberculosis medication adherence among tuberculosis (TB) and multi-drug resistance tuberculosis (MDR-TB) patients. Exclusion criteria consist of research published as a thesis or dissertation, studies that did not focus on the factors related to the successful treatment of TB, poor-quality study designs, and confusing arguments in the literature.

Researchers inferentially extracted data from each article. The literature review approach is illustrated in Figure 1. Data were analysed and presented containing several aspects such as author, country, study design, sample, population, and findings that were utilized to extract the data. The first author of this work was responsible for article selection and data extraction, while the other authors screened and verified the consistency.

The data analysis in the literature review necessitates that the data from the main source be sorted, encoded, classified, and summarized to describe the research problem in this study (22). To reach the aim of this study, data were extracted using the social-ecological model, which consists of four levels: individual, interpersonal, community, and societal factors. The process of the review article is depicted in Figure 1.

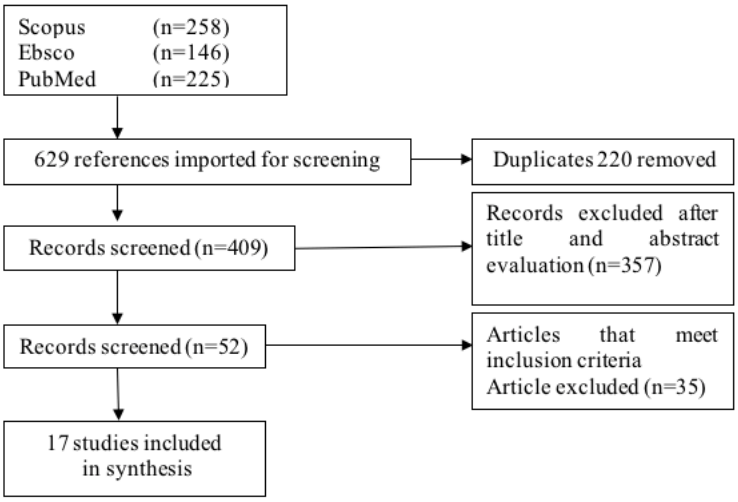

Figure 1. Flow chart of the identification process on review article.

RESULTS

Based on Table 1 Total below concerning on summary selection of studies that related tuberculosis medication adherence in adult patients of 17 studies was included in this literature review. Three articles were qualitative studies, 12 were quantitative studies (4 cross-sectional, 4 cohort, and 4 case-control studies), and 2 used a mixed-method design. These studies were conducted in China (5), Ethiopia (3), Kenya (2), Indonesia (2), Washington D.C. (1), South Korea (1), Eritrea (1), Brazil (1), and Uganda (1).

Based on this review's results, there are several factors or determinants of TB medication adherence that can be organized into four groups: individual, relationship, community, and societal. The categorization of each determinant is displayed in Table 2.

Table 1. Summarize Selected Studies of Factors that Related Tuberculosis Medication Adherence in Adult Patients.

Nº	Study	Country	Design	Sample	Population	Factors Related to Medication Adherence
1	Bea et al. (2021)	South Korea	Cohort study	987	TB patients	Patients who initiate triple regimen (9 months), >60 years, patients with medical aid and comorbidities
2	Du et al. (2020)	China	Cross-sectional	564	TB patients	Age, unemployed, education, previous TB treatment, drug consumption, knowledge about TB, anxiety, stigma, alcohol consumption, medication supervision, adverse drug reaction
3	Asriwati et al. (2021)	Indonesia	Case-control study	136	TB patients	Role of health workers, the side effect, misperception of feeling healthy, knowledge
4	Zhang et al. (2020)	China	Qualitative study	17	TB patients	Patient-related factors (lack of knowledge of PTB treatment, poor self-management capability, poor self-regulation capability, and misperception of health condition), medication-related factors (medication side effects), health service-related (poor treatment skills of doctors in primary hospitals and a lack of directly observed treatment (DOT)), sociocultural factors (effect of traditional Tibetan medicine, lack of family member support and discrimination)
5	Yan et al. (2018)	China	Cross-sectional	1342	TB patients	Stigma, depressive symptoms
6	Eastment et al. (2017)	Washington D.C., U.S	Retrospective cohort study	393	Patients who initiated TB treatment	Behaviour (smoking and drinking alcohol), had more medical problems, type of treatment regimen, type of insurance
7	Boru et al. (2017)	Ethiopia	Qualitative study	22	TB patients	Inadequate eating, stigma and discrimination, the relationship between health workers and patients, beliefs in traditional medicine, lack of health facilities, drug side effects
8	Fang et al. (2019)	China	Cross-sectional	339	TB patients	Marital status (divorced or widowed), annual income, TB knowledge, and medical staff visit
9	Xing et al. (2021)	China	Mix method study	138	MDR-TB patients and health workers	The negative side effects busy work schedule, being female, self-perceived symptom improvement, financial difficulties, being from an urban area, being unmarried, having migrant status, being supervised by the health provider
10	Wanyonyi et al. (2017)	Kenya	Cross-sectional	252	Patients on DOTS	Age (over 60 years), income, daily alcohol consumption of > 3 days per week, and average waiting time of more than 1 hour in primary health care
11	Gebreweld et al. (2018)	Eritrea	Qualitative study	12	TB patients	knowledge, low income, drug side effects, treatment duration, distances to health care facility, stigma, lack of social support, health provider-patient relationship
12	De Oliveira et al. (2018)	Brazil	Case-control study	478	TB patients	Drugs consumption, non-adherence to a previous regiment, history of smoking, low income
13	Wekunda et al. (2021)	Kenya	Cohort study	291	TB patients	Alcohol consumption, female, lower education level, having treatment supporters, misperception of feeling healthy, stigma, distance from home to the health facility, lack of food, adverse event, perception of not having TB
14	Woimo et al. (2017)	Ethiopia	Mix method	261	TB patients	Knowledge, cost of medication other than TB, the distance of PHC from home, cost of transportation, having of health information at every visit, a lack of understanding concerning the importance of treatment completion
15	Ruru et al. (2018)	Indonesia	Case-control study	264	TB patients	Difficult access to healthcare, Lack of TB knowledge, treatment experience (TB education provided by the nurse)
16	Batte et al. (2021)	Uganda	Cohort study	227	MDR TB patients	Previous treatment
17	Mekonnen & Azagew (2018)	Ethiopia	Cross-sectional	314	TB patients	In the continuation phase, comorbidity, poor patient-provider relationship, alcoholic, being busy, being out of home/town, poor knowledge of TB, forgetting

TB: Tuberculosis; PTB: Pulmonary Tuberculosis; MDR-TB: Multi-Drug Resistant – Tuberculosis; DOTS: Directly Observed Treatment Short-Course

Table 2

Factors of Medication Adherence

Factors	Study
Individual	1,2,3,4,6-17
Relationship	2,4,7,8,9,13,17
Community	2,3,4,5,7,8,9,10,11,13,14,15,17
Societal	6,9

Individual

The individual is the first level of factors in the Social-Ecological Model. Sixteen studies mentioned individual factors related to tuberculosis medication adherence. The sociodemographic of individual factors found that low income, comorbidities, age, and education level impact TB medication compliance. We found 7 studies showed low income and experienced loss of job as a significant factor of adherence (12,16,23–27), 6 studies for comorbidities (16,28-31), and 2 studies for age/elderly (25,28), and 2 studies for the level of education (16,32). TB patients with low income have difficulty paying for transportation costs to health services and also face a lack of food during treatment (12,13,27,32). TB patients with comorbidities such as depression, diabetes mellitus, and HIV are more noncompliant with TB medication. Low treatment adherence in the elderly may be attributable to the increased probability of multimorbidity and resulting polypharmacy risk in this population (28). Moreover, less-educated patients may comprehend less about tuberculosis and the necessity of treatment adherence (32).

Sixteen studies confirmed that individual factors included side effects, lack of knowledge, misperception of TB treatment, behavioural factors, history of interrupted, and being away from home. It was found individual factors including 6 studies for side effects (12,13,16,24,33,34), five studies for lack of knowledge (12,16,33-35), four studies for the misperception of TB treatment (24,32-34), three studies for behavioural factors (16,25,30), three studies for the history of interrupted (16,32,36), and one studies for being away from home (29).

The side effect of the medication also a key factor related to TB medication compliance. The side effect will lead to the misunderstanding that the condition worsens. If patients are not explained the side effects of anti-TB medications, the patient will discontinue the regimen (16,33). One of the critical factors of individual factors that affect successful TB medication is knowledge about TB and its medication. If patients had good knowledge about TB disease, management, and medication, they might adhere to the regimen. Appropriate knowledge will influence personal attitudes and behaviours toward treatment compliance, helping the patient's healing process (33). Patients also have a misconception and believe they have been cured even though they have not finished treatment yet (24,34). Behavioural factors such as alcohol, drug consumption, and smoking play an essential role in the success of TB treatment. Alcohol disrupts sleep patterns, affects judgment, and causes forgetfulness. Patients may forget to take their prescriptions or miss appointments, causing the therapy to be interrupted. TB patient who previously interrupted treatment has a chance to do the interruption again. Being away from home or town was cited as a factor for TB patients to stop taking anti-TB drugs because the patients tend to neglect pulmonary TB treatment (29).

Relationship

The relationship is the second level of factors in the Social-Ecological Model. The second level investigates intimate relations that may enhance the potential for health behaviour (37). Seven studies confirmed that relationship factors had supporters from social or family and patient-health provider relationships. There were six studies on the patient-health provider relationship (13,16,23,24,29,34) and two studies on support from social and family (32,34). Medication supporters from social and family lead to successful TB therapy. Support from social and family is critical for adherence to anti-TB therapy by supporting money for food and transportation, encouraging, motivating, and reminding patients of their medicine, helping with drug administration, and offering support to patients who have lost hope (13). A poor patient relationship with providers was also linked to lower TB drug adherence. Poor relationship between patients and healthcare professionals

has created a gap in providing patients with accurate information about the therapy. This may cause patients to withhold their concerns from caregivers (13).

Community

Community is the third level factor of the Social-Ecological Model. Community factors such as schools, offices, and society, where connections occur, aim to discover the aspects of these settings connected with health behaviour (37). In this study, thirteen studies related to the community factors, including health providers' attitudes, roles, and capability, stigma and discrimination, difficult access to health facilities, beliefs system, and health facility service. The most barrier to these factors was found in eight studies for health providers' attitudes, roles, and capability (13,23,24,27,29,33-35), six studies for stigma and discrimination (12,16,29,31,32,34), and five studies for difficult access to health facilities (12,13,27,32,35), two studies for beliefs system, and one study for health facility service (25).

Health providers' attitudes, roles, and capabilities in caring, giving information, and support are among the main factors in TB medication adherence. The role of health providers in assisting pulmonary tuberculosis patients can enhance awareness, motivation, and cooperation in treatment, so it can help them boost their spirit and willingness for successful treatment (33). Stigma is one of the critical determinants of the successful treatment of tuberculosis. Stigma and discrimination reduce patients' self-esteem, efficacy, and confidence, decreasing adherence to therapy (31). Difficult access to health facilities, particularly those from rural areas, has significantly impacted Adherence to TB treatment, especially in developing countries with restricted services and inadequate infrastructure (13). The belief system of traditional medicine can affect medication adherence among Tuberculosis patients because the patients believe that traditional medicine is more effective, affordable, and accessible, has less time for treatment, and keep away from bad spirits (13,34). A study in Nandi County revealed that the dropout of TB patients was associated with a long waiting time at the health care facility because they are dissatisfied with the service and are reluctant to return for the next appointment (25).

Societal

The last factor in Social-Ecological Model is societal factors. Societal is the fourth level according to this model. Societal factors include national and international policies, cultural values, and norms (38). In this literature review, two studies related to societal factors include one for lack of insurance (20) and one for migrant status (24). lack of insurance is connected with a lower rate of TB treatment completion (30). Lack of resources for basic insurance is likely a sign of poverty, implying that patients lack the finances to visit the clinic. However, TB treatment is free in the DOTS program (30). Patients with tuberculosis who were migrants had more non-compliance behaviours (24). Migrant status is connected with non-compliance with treatment, with migrants concealing or fleeing treatment canters out of fear of deportation (39).

DISCUSSION

The Social-Ecological Model is a framework designed to help people comprehend the many levels of society and how people and the environment interact in social systems. Factor interactions are examined at four levels, with components within a single level having equivalent effects. At all levels of health, different causes and determinants exist, making prevention, control, and intervention most successful when models are addressed from all levels. Therefore, working on multiple model levels simultaneously is required (37,40).

Adherence to TB medication is a complex issue influenced by multiple factors or determinants. The individual factor is the first level factor of the social-ecological model. All of the papers mentioned that individual factors affect medication adherence or successful treatment among TB patients. Individual factors are the most mentioned or frequent factor related to TB medication because patients undergo the treatment. Patient-based interventions are needed

to increase patients' awareness and attitude toward TB and its medication for the success or cure of tuberculosis patients. From the study, the most factors from the individual level are income, knowledge, and side effect. For income barriers, financial help or support for food, transportation, and medication adherence significantly increased when participants understood TB prevention and therapy. A study from Kenya showed that some participants were confused if the condition could be treated, while others were unaware of the length of treatment. As a result, comprehensive teaching and counselling at the start of TB therapy are critical to improving drug adherence (16). Side effects might lead the patients to stop taking their medication because they believe their symptoms are worsening. Explaining the symptoms of side effects while receiving therapy and monitoring may be done to prevent medication side effects (33).

The relationship factor is the second level factor of the Social-Ecological Model. The family plays a role in supervising and motivating the patient to regularly swallow the drug for up to 6 months to recover completely (41). Not only family, friends, neighbors, and partners, for example, impact a person's conduct and add to their experiences. At this level, prevention strategies may include family-focused prevention and social programs to build communication and encourage positive norms, problem-solving skills, and healthy behaviours to increase successful medication adherence (37).

The third level of factor from the Social-Ecological Model is community factors. Community factors play crucial parts in adhering to tuberculosis treatment. One of the community factors is the role of health providers and social workers, who are still needed to provide support, information, and motivation to make the treatment program for tuberculosis patients more successful. Their efforts in providing information related to TB and the treatment process, especially the side effects of DOTS, are needed for TB patients to take treatment without fear of side effects and learn how to manage DOTS side effects. Healthcare practitioners must pay greater attention to patients' opinions and concerns and devote additional time to listening to their experiences with sickness (42). Health workers need to increase trust in patients so that patients can comply with tuberculosis treatment. One way to improve the role of health providers is that medical staff visits benefit treatment adherence because patients perceive that health workers pay them more attention and have greater trust in their ability to get treated (23).

Stigma, discrimination, and beliefs are community factors that can also affect the patient's success in recovering from tuberculosis. Unwanted social standards in society cause stigma and discrimination. As a result, the structure of a community's beliefs and norms regarding an illness and the associated stigma may significantly influence health (43). Social and psychological programs aimed at reducing stigma among tuberculosis patients should be implemented and refined to increase medication adherence (31). Community-scale program support is needed to reduce stigma and discrimination and change views on tuberculosis treatment with traditional medicine and by taking standardized tuberculosis drugs. Furthermore, paying attention to psychological support for the patients increases adherence to the therapy (16).

The fourth level factor of the Social-Ecological Model is the societal factor. The literature showed that lack of insurance can affect medication adherence among tuberculosis patients. Therefore, it is needed to find an intervention targeting the social or policy level. Changes in medical insurance coverage for prescription medications are one example of a societal-level factor (44). Even though the medication for tuberculosis is free, regulations are needed to improve the patient's economy and make it easier for patients to reach tuberculosis treatment.

Because these factors are classified using the Social Ecological Model into four levels of factors, further research is needed using other theories to organize factors related to adherence to tuberculosis medication. In addition, there are some limitations to this study. First, this study uses only three databases (Scopus, PubMed, and Ebsco), so there may still be unanalyzed journals from other databases. This study is limited to English, and factors originating from other languages cannot be analysed. Lastly, this study is only grouped into four factors, so there may be other factors or determinants affecting TB patients' adherence to treatment.

CONCLUSION

Many factors can affect patient compliance. The most mentioned from the literature review of determinants of tuberculosis medication adherence were individual factors. However, apart from individual factors, other factors, such as relationships, community, and societal factors, contribute to tuberculosis treatment success. Therefore, health workers must pay attention to multiple factors in developing or planning programs to increase patient success in undergoing tuberculosis treatment, focusing on individual and all factors. Family and health workers also play an essential role in tuberculosis treatment success.

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Relationship quality of nursing work life and burnout among nurses: A systematic review

Relación calidad de vida laboral de enfermería y burnout entre enfermeras: Una revisión sistemática

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SUMMARY

Introduction: *Nurses are professionals who are significantly at risk of experiencing burnout due to their high workload and work stress, most of which are caused by long-term patient interactions. One of the causes of burnout is the occurrence of work-family conflicts, which will cause a decreased quality of nursing work life. Moreover, this study intends to identify the relationship between the Quality of Nursing Work Life (QNWL) and burnout among nurses.*
Methods: *This study conducted a systematic review using four academic databases (Science Direct, PubMed, Scopus, and ProQuest) with a publication range from 2017 to 2022. Furthermore, the subjects in this study were nurses who worked in hospitals. Therefore, these variables include quality of nursing work life and burnout. The inclusion criteria in the literature study were cross-sectional articles measuring QNWL and burnout among nurses. The guidelines for reviewing journals used Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA).*
Results: *The results of 20 studies exploring QNWL and nurse burnout. Moreover, most reviews of the result showed a significant relationship between QNWL and burnout among nurses. Furthermore, the factors related to QNWL, and burnout include environmental factors including role conflict, workload, lack of social support, pressure from patients, bullying at work, lack of professional development opportunities, alcohol consumption, and level of flexibility in working time while personal factors are gender, age, marital status, personality, expectations, length of work, and having children.*
Conclusion: *There is a relationship between QNWL and burnout among nurses. In addition, nurse burnout needs to be controlled because it can affect QNWL nurses, impacting the quality of nursing care, satisfaction, and performance.*

Keywords: *Burnout, Nurse, Quality of Nursing Work Life.*

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RESUMEN

Introducción: *Las enfermeras son profesionales que tienen un riesgo significativo de sufrir burnout debido a su alta carga de trabajo y estrés laboral, la mayoría de los cuales son causados por interacciones a largo*

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plazo con los pacientes. Una de las causas del burnout es la ocurrencia de conflictos trabajo-familia, lo que provocará una disminución de la calidad de vida laboral de enfermería. Además, este estudio tiene como objetivo identificar la relación entre la Calidad de Vida Laboral de Enfermería (QNWL) y el desgaste profesional de los enfermeros.

Métodos: *Este estudio realizó una revisión sistemática utilizando cuatro bases de datos académicas (Science Direct, PubMed, Scopus y ProQuest) con un rango de publicación de 2017 a 2022. Además, los sujetos de este estudio fueron enfermeras que trabajaban en hospitales. Por lo tanto, estas variables incluyen la calidad de vida laboral de enfermería y el desgaste profesional. Los criterios de inclusión en el estudio de la literatura fueron: artículos transversales que miden QNWL y burnout entre enfermeros. Las pautas para la revisión de revistas utilizaron Elementos de informes preferidos para la revisión sistemática y el metaanálisis (PRISMA).*

Resultados: *Los resultados de 20 estudios que exploran QNWL y el agotamiento de las enfermeras. Además, la mayoría de las revisiones de los resultados mostraron una relación significativa entre la QNWL y el agotamiento entre las enfermeras. Además, los factores relacionados con QNWL y el agotamiento incluyen factores ambientales que incluyen conflicto de roles, carga de trabajo, falta de apoyo social, presión de los pacientes, intimidación en el trabajo, falta de oportunidades de desarrollo profesional, consumo de alcohol y nivel de flexibilidad en el tiempo de trabajo, mientras que los factores personales son sexo, edad, estado civil, personalidad, expectativas, tiempo de trabajo y tener hijos.*

Conclusión: *Existe una relación entre QNWL y burnout entre enfermeros. Además, el agotamiento de las enfermeras debe controlarse porque puede afectar a las enfermeras QNWL, afectando la calidad de la atención, la satisfacción y el desempeño de enfermería.*

Palabras clave: *Burnout, enfermera, calidad de vida laboral de enfermería.*

INTRODUCTION

High stress associated with various diseases and the increased workload have led to nurses' high risk of burnout (1). Burnout is a critical condition that affects patient safety and the functioning of healthcare organizations (2). Nurses are professionals who are very at risk of experiencing burnout due to their high workload and work stress, most of which are caused by long-term interactions with patients (3). Burnout causes low job satisfaction and a high turnover rate for nurses (4).

The problem of burnout abroad is a trending issue that shows an increase in health services. In California, 30 % of nurses experience burnout, and 31 % do not experience job satisfaction. Another survey indicated that 85.5 % of female nurses experienced burnout (5). The same research presented that 67.2 % of nurses were lack of satisfaction with the quality of their work life, which impacts burnout (6). Research in Ghana showed that one of the causes of burnout is work-family conflict, which will cause a decrease in female nurses' work-life quality (7). In addition, low QNWL has an essential role in the incidence of burnout (8). QNWL is important for nurses in carrying out their duties and work; a good work-life can positively impact performance (6).

Many researchers have discussed burnout in paediatrics, gynecology, exigency, and nursing principles, and other investigators have reviewed the relationship of burnout to social support. However, no review has been conducted to determine the relationship between QNWL and burnout and the factors associated with QNWL and burnout. Therefore, the review aimed to assess the relationship between QNWL and burnout.

METHODS

Study Design

This systematic review follows the guidelines of the Statement of Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA). In addition, data has been completed on a journal review using four academic databases (Science Direct, PubMed, Scopus, and ProQuest) with a publication range from 2017 to 2022.

Inclusion and Exclusion Criteria

The inclusion criteria for this systematic review have been determined using population, intervention, comparison, outcomes, and study design (PICOS). The population in this study were nurses who worked in hospitals. We employed cross-sectional studies examining QNWL and burnout among nurses. The exclusion criteria such as (a) studies that did not examine QNWL and burnout, (b) studies that did not involve

nurses, (c) qualitative studies and review articles because there were no numerical measurements provided of QNWL and burnout, (e) intervention research and (f) publication in a language other than English.

Search strategy

This literature search used articles in English from Pubmed, Science Direct, Proquest, and Scopus from 2017 to 2022. The literature search used the keywords "Quality of nursing work life", "burnout", and "nurses". The literature search found there were 1 296 articles filtered using the keywords above. The articles were then narrowed down and identified based on the PICOS and obtained as many as 109 articles that could be included in the article screening process. At the article screening stage, according to the suitability of the article based on the abstract, there were 74 articles. Then a feasibility selection was carried out based on the whole discussion's essence and scope in the article. It was found that 32 articles could be made for further selection, namely as many as 20 articles included in the inclusion and 12 articles excluded.

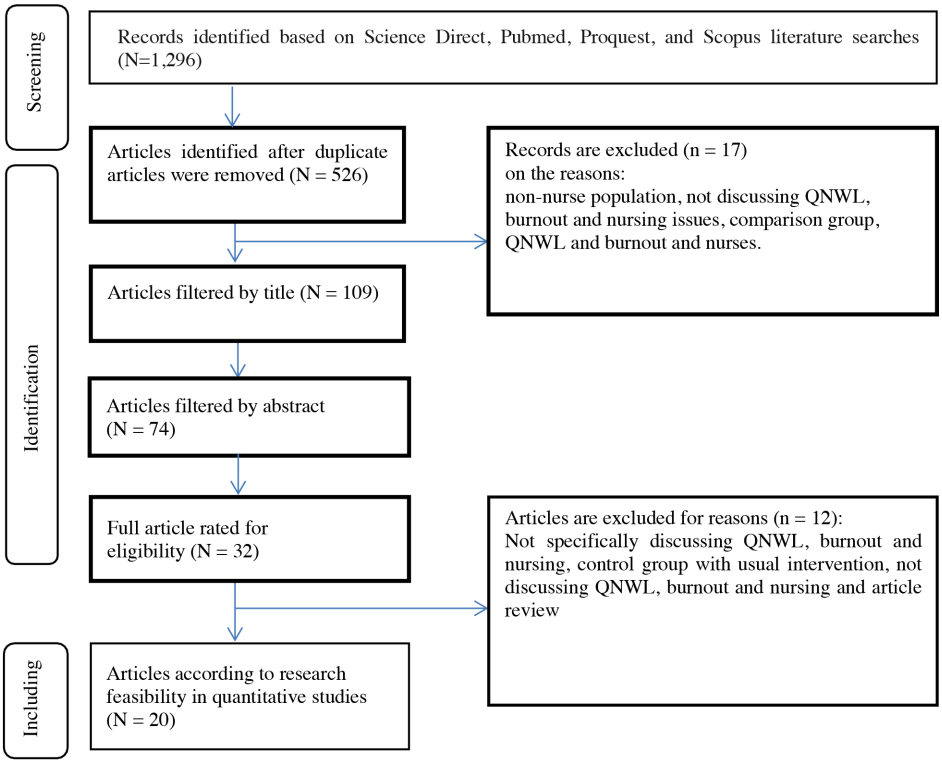

Figure 1. PRISMA Literature Search Flowchart.

RESULTS

Summary of Sociodemographic Characteristics of The Studies

The sample is oncology nurses (9), operating room nurses (10), psychiatric nurses (11-13), Critical nurses (14), and ICU nurses (15). The studies involved mostly female nurses (19 studies), married nurses (13 studies), and undergraduate nursing (10 studies).

Definitions of QNWL and Burnout of Reviewed Studies

The study found explaining the definition of QNWL is defined as the ability of employees to meet their important personal needs while

Table 1. Summary of Sociodemographic Characteristics of The Studies Reviewed.

Author (year)	Country	Gender	Age	Marital status	Education	Length of work
Alotni & Elgazzar (2020)	Saudi Arabia	Female (93.5%)	<40 years (60%)	Single (50%)	Bachelor's degree (97.6%)	1-6 years (64.1%)
Casida et al (2019)	United States of America	Female (83%)	43.3 years	Married (62%)	Masters (89%)	5.8 years
Celmeçe & Menekay (2020)	Turkey	Female (80.5%)	-	Married (54%)	-	-
Elias et al (2020)	Cairo	Female (64%)	40 years (53%)	Marry (81%)	Diploma in Nursing (74%)	10 years (51%)
Erkorkmaz et al (2018)	Turkey	Female (87%)	< 25 years (69.5%)	Married (57.3%)	Bachelor of Nursing (69.5%),	1-5 years (38.2%)
Ewa Kupcewicz (2020)	Northeast Poland	-	-	Marry (76.8%)	Bachelor of Nursing (34.8%)	-
Hong J, et al (2021)	Korea	Female (92.9%)	Average < 30 years	Married 77.9% have children (85%)	-	Average 5.4 years
Huang H, et al (2020)	China	Female (55%)	-	Marry (42%)	Bachelor (60%)	< 3 years (50%)
Jais et al (2021)	Brunei Darus-salam	Female (77.8%),	-Average 20-50 years	Marry (55.6%),	Bachelor (39.7%)	Average 0-10 years
Jarzynkowski et al (2022)	Poland	Female (74.2%)	-Average 23-63 years	Marry (60%)	Nursing secondary school 23.1%.	Average 1.5- 43 years old
Nursalam, et al (2018)	Indonesia	Women (61.2%),	36-40 years (33.6%),	-	Bachelor (49.3%)	5-10 years ((51.5%)
Paniora et al.(2017)	Greece	Female (49%)	Average < 40 years	Married (46%)	Bachelor (52%)	Average <10 years
Permarupan, et al (2020)	Malaysia	Female (85%)	31 - 41 years (52.8%)	Marry (57.6%)	Bachelor (78.9%)	6-10 years (35.6%)
Raeissi et al. (2019)	Iran	Female (70.4%)	21 and 29 years old (43%)	Marry (63.1%)	Bachelor (57.2%)	5 years (59.9%)
Ruiz-Fernández et al (2020)	Malaysia	Female (75.5%),	Average 23-64 years old	Marry (69.8%)	-	275.36 months
Seo et al (2020)	Seoul Korea	Female (91.4%)	< 30 years (51.4%)	Single (71.4%)	Bachelor (78.1%)	2 years (50.5%)
Sok, S et al (2020)	South Korea	Woman (92.2%)	25-30 years (55.7%	Bachelor (84.3%)	Undergraduate (73.0%)	Average 4.5 years (66.1%)
Kim Y, et al (2019)	Seoul	Female (96.3%)	-	-	-	< 1.9 years (38.3%)
Zahednezhad et al. (2021)	Iran	81.7% Female	Average 131.4±7.47	-	-	Average 8.24 ± 6.76 years
Zeng et al (2021)	China	Female (80.5%)	-Average 19-59 years	Married & have children (80.1%)	-	Average - 1 - 40 years.

also achieving organizational goals is important element nurses possess and can affect the quality of health services provided to patients (1,12,16-19).

The concept of burnout was first described as a feeling of failure and exhaustion due to excessive demands (20). Also, it is associated with poorer physical and mental health, including increased irritability, impaired concentration, depression, headaches, insomnia (13), anxiety, and fatigue from being unable to raise children (21). While definition according to Maslach, burnout is a syndrome of emotional exhaustion, depersonalization, and decreased personal achievement (1,4,9-11,14,16,19,20).

Factors Associated with QNWL and Burnout

The study found explaining the factors associated is the most significant variable that harms QNWL and affects burnout as well, namely workload, control, community, rewards, fairness, values, and work environment (1,4,9-12,22,23), is also determined by the interaction between risk factors (e.g., symptoms of depression/ bullying and anxiety) and protective factors (e.g., good social support) (10,13,24). The sociodemographic variables associated with QNWL and Burnout are age, finances, education, gender, marital status, having children, personality, and expectations and shift work (10,14,21,22,25-28).

Another study found that burnout syndrome occurs mainly in healthcare professionals such as doctors and nurses due to their daily contact with human conflict and demands from patients. Nurses who are frequently exposed to uncomfortable patient circumstances might hurt their professional quality of life, resulting in poor patient outcomes, and working during the COVID-19 pandemic (21,29,30).

Impact of QNWL and Burnout

The rise in QNWL will impact nurses' relationships and motivation with all supporting elements in the hospital, including an awareness of the organization's aspirations and demands for environmental and work safety, as well as a pleasant working environment (18). QNWL and nurse turnover rates are difficult for healthcare organizations due to their consequences and impact on patient care (31).

While the impact of burnout is worsening health, increased absenteeism, negative emotions, conflict, depression, low job satisfaction, criticism, blame, and a lack of empathy for patients, as well as decreased performance and increased interpersonal difficulties, as a result, the service quality is low (10,11,14,16).

Relationship of QNWL and Burnout of the Reviewed Studies

There is a very statistically significant correlation between QNWL and burnout (1,4,10,11,13,21,22,25,27,32). Professional burnout impacts the quality of life in the somatic, social and environmental domains, especially in the older group of nurses (25). Poor QNWL was significantly associated with low levels of empathy, and this relationship was mediated by personal achievement, a sub-dimension of burnout (30).

The provision of high-quality health care is linked to nursing personnel with higher QNWL, which increases psychological empowerment and reduces the effects of burnout (4), increases organizational commitment and job satisfaction, improves the quality of care, increases individual and organizational productivity, and reduce individual and organizational burnout and turnover (33). The unavailability of the QNWL factor is the main cause of poor performance and leaving work (18).

Strategies to Improve QNWL and Reduce Burnout

Hospital managers and nurses must develop strategies to reduce burnout nurses and improve QNWL, such as optimal nursing staff arrangements, offering reasonable financial compensation, and establishing appropriate shift work schedules (34). The nurse's teaching strategies for managing stress and practicing life practices, providing consultation, producing a supportive environment, and providing psychological services areas to limit turnout (14). Provide adequate and fair compensation,

Table 2. Summary of Reviews on QNWL and Burnout Among Nurses.

Study	Design	Sample	Instrument	Results
Alotni & Elgazzar (2020)	Cross-sectional	170 critical care nurses	Professional Quality of Life & MBI Scale	Age, nationality, years of experience, and the desire to change departments are all significantly related to burnout. Finally, burnout and the critical care nurses' quality of life scores significantly correlated.
Casida et al (2019)	Cross-sectional	47 Nurse Practitioners	QOWL scale & Copenhagen scale	Work-related fatigue is negatively associated with low QNWL among practicing nurses
Celmeçe & Menekay (2020)	Cross-sectional	240 healthcare professionals,	Quality of Life Scale & (MBI)	Healthcare personnel caring for COVID-19 patients may experience stress, anxiety, and burnout, which can negatively impact their quality of life.
Elias et al (2020)	Cross-sectional	100 mental nurses	Professional Quality of Life Scale (ProQOL) & MBI	There is a very statistically significant correlation between endurance, fatigue, and QNWL
Erkorkmaz et al (2018)	Cross-sectional	131 nurses	Professional Quality of Life Scale (ProQOL-30 items) & MBI	Nurse fatigue negatively affects nurses' quality of work life / QNWL
Ewa Kupcewicz (2020)	Cross-sectional	1,806 nurses working in 23 hospitals in northeastern Poland	WHOQoL-Bref, Rosenberg Self-Esteem Scale & Copenhagen	Burnout harms the quality of life both socially, somatically, and in the environment, especially for nurses in the elderly group, so a strategy is needed to overcome it. burnout
Jais et al (2021)	Cross-sectional	63 Nurse Oncology	Copenhagen Psychosocial Self-administered QNWL Questionnaire & Maslach	Improved leadership qualities, respect, fairness, and respect can minimize emotional exhaustion among oncology nurses
Jarzynkowski et al. (2022)	Cross-sectional	325 nurses in 7 hospitals in Poland.	(AWS) & Maslach Fatigue syndrome inventory (MBI)	Workplace factors such as workload, control, community, rewards, fairness, and values were found to be predictors of job burnout among those surveyed.
Hong J et al (2021)	Cross-sectional	227 nurses	Quality of Life Scale & (MBI)	Free time and rest are easier for nurses to find in two shifts so that they can increase job satisfaction by increasing the continuity of care
Huang H, et al (2020)	Cross-sectional	52 nurses	Quality of Nursing Work Life Scale (QNWLS) & MBI	Balint group training is an excellent technique to reduce burnout among ICU nurses and increase their performance. QNWL
Nursalam, et al (2018)	Cross-sectional	134 respondent	QNWL Questionnaire, Work Effectiveness (CWEQ-II), Work Activity Scale (JAS), Organizational Relations Scale (ORS), Psychological Empowerment Scale (PES), & MBI	Structural empowerment affects psychological empowerment. Psychological empowerment is influenced by burnout, and burnout affects QNWL
Paniora et al. (2017)	Cross-sectional	100 mental health nurses and nursing assistants working in a psychiatric centre	Professional Quality of Life Scale (ProQOL-30 items) & MBI	Burnout rates of nurses and nursing assistants working in psychiatric centers are low
Permarupan, et al (2020)	Cross-sectional	432 nursing staff from 10 hospitals in the Selangor area	Self-administered QNWL Questionnaire & MBI	Psychological empowerment can reduce the effects of burnout by mediating QNWL

(continue on page S1211).

Table 2. Summary of Reviews on QNWL and Burnout Among Nurses. (continue from page S1210).

Study	Design	Sample	Instrument	Results
Raeissi et al. (2019)	Cross-sectional	22391 nurses in 85 Iranian public hospitals	Professional Quality of Life Scale (ProQOL-30 items) & MBI	Approximately 64.0% of nurses underwent burnout, and their QNWL was at a moderate level. Workplace weariness, hospitalization rate, salary, age, night shift, and patient-nurse ratio are all important aspects of working life quality.
Ruiz-Fernández et al (2020)	Cross-sectional	1521 nurse	Professional quality of life (ProQOL v. IV)	Burnoutaffected by shift work. Work-related factors affect QNWL
Seo et al (2020)	Cross-sectional	105 healthcare professionals from public hospitals in Seoul	Jefferson of Physician Empathy scale, and one sentence WLB & MBI subjective question	Personal achievement was considered a potential mediating variable between QNWL and empathy. Conclusions that encourage personal achievement can help reduce burnout among health professionals
Sok, S et al (2020)	Cross-sectional	115 nurses treat DNR patients in the ICU at a South Korean hospital.	Professional Quality of Life Scale (ProQOL-30 items) & Copenhagen	Burnoutpositively related to job stress and depression
Kim Y, et al (2019)	Cross-sectional	324 nurses	ProQoL & MBI	Preventing bullying in the workplace is important for reducing burnout and clinical nurse turnover.
Zahednezhad et al. (2021)	Cross-sectional	202 Iranian nurses employed in three teaching hospitals	QNWL Brooks & Maslach	Endurance and QNWL are protective variables against fatigue in nursing professionals
Zeng et al (2021)	Cross-sectional	1449 nurse	(WHOQOL-BREF) & (MBI)	Psychiatric nurses who report fatigue have lower QOL Fatigue is common among psychiatric nurses in China

workplace constitution, safe and healthy working conditions, social integration in the workplace, the social importance of working life, opportunities to grow and be safe, opportunities to use and develop human resources, and work and life span at the workplace (4,34).

Nursing managers can foster a support network of friends and colleagues, as well as a strong teamwork spirit, by adopting policies to improve work-life quality in nursing professionals, such as providing professional development opportunities, work-life balance, managing workload, providing an adequate nursing workforce, providing a safe work environment, and increasing financial compensation. Furthermore, routine screening of nurses for burnout symptoms and the psychological impacts of the COVID-19 pandemic is required to identify nurses who are at risk and intervene quickly (1).

Increase physical activity and mental health (12). Psychological therapies have been reported to help nurses and doctors deal with burnout and other psychological issues., such as Mindfulness-Based Stress Reduction (MBSR), Cognitive Behavior Therapy (CBT), Balint Group (BG), and so on (16). Compared with no intervention, Balint group training results in a greater reduction in burned-t and increased QNWL(16). In addition, coworkers are a valuable resource for decreasing the consequences of psychological stress and reducing the likelihood of nurses switching jobs (35). However, rational, emotional therapy also positively reduces nursing work stress and burnout (36).

DISCUSSION

The results of our review show that most studies discuss about QNWL and Burnout, QNWL is important element nurses possess and can affect the quality of health services provided to patients (18). It is related to job satisfaction, turnover rate, and job stress (16). Concept of burnout definition according to Maslach, burnout is a syndrome of emotional exhaustion, depersonalization, and decreased personal achievement (1,4,9,10,14,16,20). Emotional exhaustion is a feeling of physical and mental tiredness that results in the desire

to leave the workplace. Depersonalization is a callous negative cynicism/ignorance in attitude and feelings of hostility towards others (whether clients or coworkers). Finally, the reduced personal achievement is a feeling of not achieving anything of value at work and feeling inadequate and powerless (10,11,19). Most nurses experienced low QNWL and moderate to high burnout rates and explicitly concluded that QNWL was associated with burnout incidence in nurses (1,10).

The factors associated is the most significant variable that harms QNWL and affects burnout as well are Individual factors and environmental factors. Environmental factors include role conflict, workload, lack of social support, control, community, rewards, fairness, values, and the level of flexibility of working time, while personal factors are gender, age, marital status, personality, and expectations (10,18,26). However, the different levels of fatigue across the included studies could be explained by different work environments such as different units/wards, shift work (28), and different workloads (10). Women suffer from higher burnout rates than men. The results of other studies show the level of burnout experienced by female nurses was 89 % (38). This study validated the effect of higher education on job burnout levels and found that more education was most typically related to greater responsibility and, in some cases, larger job breadth (10). Low salaries and heavy workloads will cause nurses to experience work fatigue, decreased motivation, and decreased willingness, and creates a low quality of work life (18). Burnout is too influenced by shift work (39). Shift work has been shown to cause circadian rhythm disturbances. As a result of sleep deprivation, shift workers are likely to experience disruption of daily life, which can lead to chronic illness, higher levels of fatigue harm to job satisfaction and quality of life (28).

There is a very statistically significant correlation between QNWL and burnout. The low QNWL is predominant in nurses' burnout incidence (8). QNWL is important for nurses in carrying out their duties and work; a good work-life can positively impact performance (6). Several other work-related factors cause burnout and require professional attention to reduce burnout effects among nursing staff (40). Research in Ghana shows that one of the causes of burnout is work-family conflict, which will cause a decrease in QNWL in female nurses (7).

Nurse burnout needs to be controlled because it can affect the nurse's QNWL it has an impact on the quality of nursing care, satisfaction, and performance. Many strategies can be done to increase the QNWL of nurses and reduce burnout, namely by increasing a conducive work environment and support from managers(1,41,42) Increase physical activity and mental health (12). Due to its impact on nurses' health and patient care, a comprehensive intervention program such as salary increases, working hours reduction, and counseling sessions on stress management is needed to improve QNWL and prevent nurse burnout. In addition, social support and managers are also important to prevent nurse burnout and improve QNWL (14). In addition, it is important to control the workload that makes nurses vulnerable to burnout, such as high workload and low satisfaction (10). Improving the work environment remains a solution for hospitals in reducing burnout (43).

Our systematic review shows there is a relationship between QNWL and burnout among nurses. QNWL is important for nurses, a good work-life can have a positive impact on the performance of nurses. In addition, nurse burnout needs to be controlled because it can affect QNWL nurses, impacting the quality of nursing care, satisfaction, and performance. Improving the work environment is a solution for hospitals that want to simultaneously reduce burnout and increase nurse and patient satisfaction in providing safe and high-quality care. So that hospital management needs to make further efforts to improve QNWL and reduce burnout are increasing a conducive work environment and management support and increasing physical activity and mental health, as well as through continuous training in good workload management, increasing nurse control in carrying out tasks and creating a reward system that recognizes nurses' contributions with a caring approach.

CONCLUSION

Most studies show a positive relationship between QNWL and burnout. Burnout rates

were moderate to high in all included studies and influenced nurses' QNWL. Factors related to QNWL and burnout include environmental factors including role conflict, workload, lack of social support, pressure from patients, bullying at work, lack of professional development opportunities, alcohol consumption, and level of flexibility in working time, while personal factors are gender, age, marital status, personality, expectations, length of work, and having children. Some strategies that can be done to increase the QNWL of nurses and reduce burnout are increasing a conducive work environment and management support and increasing physical activity and mental health.

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The effectiveness and usability of electronic partograph for obstetric care: A systematic review

La efectividad y la utilidad del partograma electrónico para la atención obstétrica: Una revisión sistemática

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SUMMARY

Introduction: *Partograph is an instrument used to monitor and prevent labor complications. Unfortunately, a large number of situations where there is limited awareness of how to use a partograph as a labor monitoring tool. One of the efforts made is to develop partographs in the form of electronic partograph (e-partograph) applications. This review aims to analyze the effectiveness and usability of electronic partograph for obstetric care.*
Methods: *This study conducted a systematic review of journals using three academic databases (Science Direct, PubMed, and Google Scholar) with a publication range from 2016 to 2022. Furthermore, the subjects in this study were skilled birth attendants (SBAs) and obstetric care providers. Inclusion criteria in the literature study were using electronic-based partographs in monitoring. The journal-reviewed guidelines used Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA).*
Results: *This study found 13 studies exploring the e-partograph in the last six years (2016-2022). Most of the results reviewed the effectiveness of using e-partographs compared to paper partographs. In addition, the e-partograph has shown another advantage. There was a reminder system when filling in data by the SBA. It could identify if the labor process were normal or required further treatment. Using an e-partograph could effectively save time and was easy to use. SBA was easy to accept and apply.*
Conclusion: *The use of e-partograph gives better final results than paper partograph. E-partograph is able to maintain normal delivery and reduce the incidence of cesarean section and prolonged labor. Although the e-partograph was designed to provide benefits for its users, there was an audio and visual reminder system that could be used to detect complications during childbirth.*

Keywords: *Electronic, health care, obstetric, partograph*

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RESUMEN

Introducción: *El partograma es un instrumento utilizado para monitorear y prevenir complicaciones del parto. Desafortunadamente, existe una gran cantidad de situaciones en las que existe una conciencia limitada sobre cómo utilizar un partograma como herramienta de control del trabajo de parto. Uno de los esfuerzos realizados es desarrollar partogramas*

en forma de aplicaciones de partograma electrónico (e-partograph). Esta revisión tiene como objetivo analizar la efectividad y la utilidad del partograma electrónico para la atención obstétrica.
Métodos: *Este estudio realizó una revisión sistemática de revistas utilizando tres bases de datos académicas (Science Direct, PubMed y Google Scholar) con un rango de publicación de 2016 a 2022. Además, los sujetos de este estudio fueron parteras calificadas (SBA) y atención obstétrica. proveedores Los criterios de inclusión en el estudio de la literatura fueron el uso de partogramas electrónicos en la monitorización. Las pautas revisadas por revistas utilizaron Elementos de informes preferidos para revisión sistemática y metanálisis (PRISMA).*
Resultados: *Este estudio encontró 13 estudios que exploran el e-partograph en los últimos seis años (2016-2022). La mayoría de los resultados revisaron la efectividad del uso de partogramas electrónicos en comparación con los partogramas en papel. Además, el e-partograph ha mostrado otra ventaja. Había un sistema de recordatorio al completar los datos por parte de la SBA. Podría identificar si el proceso de parto fue normal o requirió tratamiento adicional. El uso de un e-partograph podría ahorrar tiempo de manera efectiva y fue fácil de usar. SBA fue fácil de aceptar y aplicar.*
Conclusión: *El uso del e-partograma da mejores resultados finales que el partograma en papel. E-partograph es capaz de mantener un parto normal y reducir la incidencia de cesárea y trabajo de parto prolongado. Aunque el e-partograph fue diseñado para brindar beneficios a sus usuarios, había un sistema de recordatorio de audio y visual que podía usarse para detectar complicaciones durante el parto.*

Palabras clave: *Electrónica, atención a la salud, obstétrica, partograma*

INTRODUCTION

Infections, prolonged labor, bleeding, and other complications after childbirth have perished 303 000 women in 2015 (1-4). Moreover, long labor directly results in 6-10 % of maternal and infant mortality and morbidity. One of the efforts to prevent the occurrence of morbidity and mortality in mothers and babies during childbirth is by monitoring labor and handling fast and appropriate actions (1,5-7). Therefore, the World Health Organization (WHO) advocates a partograph to observe during labor (1).

Skilled birth attendants utilize partographs to record significant developments during labor. This partograph sheet was created to gather and record all pertinent data over 12 hours, beginning with the start of contractions and ending with the delivery of the baby. This partograph helps staff members decide when labor is moving normally and when they should be equipped to step in (8-12).

However, the effectiveness of using a partograph in monitoring labor is not optimal currently. This is related to the attitude of health workers who still lack knowledge of paper partographs. Furthermore, to overcome this challenge, many researchers have improved partographs (1,13). One of the efforts is to develop partographs in the form of applications (electronic partographs). An electronic version of the paper-based partograph that automatically plots labor and delivery trends is called an e-partograph. It has alarm systems installed to notify Provider Health Care staff of the upcoming examination schedule in case of danger. In addition, the development of this partograph is based on an android tablet concerning the partograph issued by WHO to make it easier for officers to monitor and document childbirth (3,5). Therefore, the e-partograph improves efficiency in filling patients' information during labor and childbirth, allows Primary health care (PHC) workers to seek and receive real-time professional support, and reduces time to accessing lifesaving care, even after normal work hours.

On the other hand, as new electronic partograph innovations are increasingly being tested and implemented in situations with limited capacity, it is critical to carefully assess what has been accomplished to inform implementers and policymakers on the effectiveness of technology in evidence-based practice.

METHODS

Study Design

This Systematic Review follows the guidelines of the Statement of Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) (14). In addition, the data has completed a review on the journal using three academic databases, including PubMed, Science Direct, and Google Scholar.

Inclusion and Exclusion Criteria

The inclusion criteria for this systematic review have been determined using population, intervention, comparison, outcomes, and study design (PICOS). Furthermore, the population in this study were skilled birth attendants and obstetric care providers who provided childbirth services and used electronic-based partographs in monitoring them. This study was also including grey literature. Moreover, the exclusion criteria, such as labor monitoring using paper partographs.

Search Strategy

This literature search used articles in English from PubMed, Science Direct, and Google Scholar from 2016 to 2022. The literature used the keywords "partograph", "electronic", and "obstetric". The literature found there were 182 articles filtered using the keywords above. The articles were then narrowed down and identified based on the PICOS and obtained as many as 109 articles that could be included in the article screening process. In the meantime, at the article screening stage, according to the suitability of the article based on the abstract, there were 150 articles. Then a feasibility selection was carried out based on the whole discussion's essence and scope in the article. It was found that 16 articles could be made for further selection, namely as many as 13 articles included in the inclusion and 3 articles excluded.

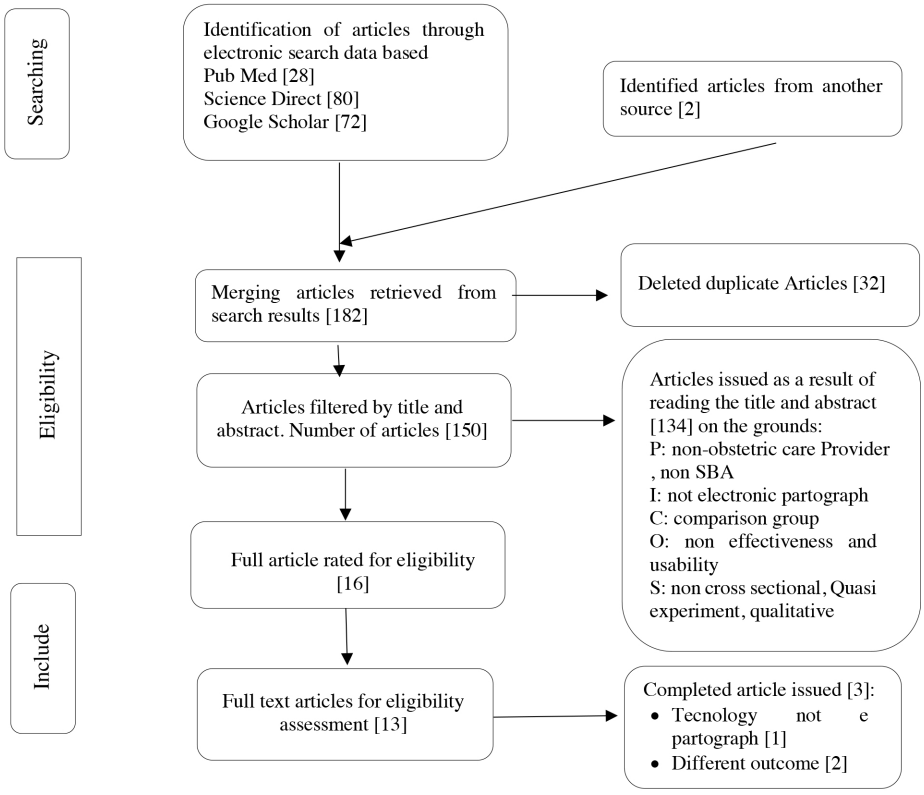

Figure 1. Steps for selecting articles are illustrated in the PRISMA flowchart.

Quality Assessment

The outcomes from the electronic search data-based articles were gathered, identified, and then exported to a Microsoft Excel spreadsheet. The filtered and qualified publications were evaluated, and three writers independently extracted data (WMN, YB, and RBU). Additionally, any

differences of opinion among the three authors (WMN, YB, and RBU) about the findings of the three reviewers were resolved through discussion and consensus. Additionally, each study's comparability, methodology (including sampling approach, response rate, and study representativeness), and outcomes were analyzed using Joanna Briggs Institute (JBI) tools. For cross-sectional, quasi-experimental, and qualitative investigations, the JBI was used to rate the methodological soundness of a study and assess the degree to which potential biases in its design and analysis had been addressed. Therefore, all articles assigned a JBI score of 50 % or more could be considered a "good" low-risk study.

RESULTS

Overview of Included Studies

The thirteen studies have been reviewed, and all labor monitoring used application-based partographs. However, the use of the term was different from one another. For example, "Life Curve", mLabor, PrasavGraph, Digital Partograph, and Intrapartum Monitoring Mobile Application (DAKSH) are android-based mobile applications (8,15,16), one of the terms for the tools used for childbirth monitoring with various gadgets that may be accessed using a smartphone or tablet or other devices (e-partograph) (1,8,17-19). digital partograph is some of the tools used based on android and Word Electric Browser (WEB), and some other names such as Web-Based Partograph and midwifery documentation use web-based (20,21).

Furthermore, these studies were conducted in five countries: India, Indonesia, Kenya, Tanzania, and Northwest Ethiopia. Because of concluding the results of the articles, it showed that users of this application-based partograph varied. For example, in Indonesia, the users of the partograph application were midwives, midwifery students, and researchers; in contrast to other countries for the life Curve [India] application, m labor used by doctors during childbirth monitoring, DAKSH is used by nurses; e used by Skilled Birth Attendant (SBA): Doctor, Nurse, Midwife. e partograph was used by SBA (doctors, midwives, nurses) and Staff nurses and medical officers. E-partograph is used by Obstetric care providers (certified midwife, nurse, Health Officers, Integrated Emergency Obstetrics, and Surgery & Medical Doctors who tend to the woman's needs throughout birth and delivery). Accordingly, to make the analysis more comprehensible, we used the research and the numerous publications in which they were reported. As a result, the findings were presented in a narrative form.

Comparing The Efficacy of e-Phartograph and paper Partograph

The use of the partograph is an important step in ensuring the high-quality care provided to mothers and newborns during labor. Further, developing an application-based partograph aims to improve care during labor by overcoming the challenge of the low use of paper partographs (8,15,22). Additionally, from the results of the analysis of the articles carried out, there was an increase in labor outcomes based on monitoring using an application-based partograph (e-partograph) compared to a paper partograph. Thus, in labor monitoring using the Life Curve Mobile application, measuring performance parameters are assessed on a scale of 1-5 with a total score of 45. Therefore, the results revealed that the Life Curve scored 42.7 compared to the paper partograph, which scored 19.52. This demonstrates that the difference ($p=0.001$) is highly significant.

On the other hand, the paper partograph (2.17 ± 1.18) was statistically significantly lower than the average-SD life curve ($4.74\pm.52$): $p=0.0002$. These findings showed that the use of a life curve mobile application improved SBA's efficiency in providing delivery care (15). In addition, this is in line with the results of other studies, which showed that using an e-partograph was easier to maintain normal labor and take action. However, on the other hand, e-partograph usage during delivery could complicate things for the mother and fetus, according to the examination of the article's data. In turn, the use of the e-Partograph results in a result of 56 % (95 % CI= 27 % -73 %), a tendency away from cesarean sections [43 %to 37 % at Jessore Hospital and from 36 percent to 25 % in Kushtia Hospital] and away from preterm labor compared to the use of the paper partograph (1,17).

Table 1. Overview of Included Studies.

Nº	Authos	Year	Countries	Name Application	User	Study Design	Score of JBI (%)
1	Begum et al.	2017	India	Life curve	Doctor	Cross-sectional	75
2	Sanghvi et al.	2017	Kenya	E-partogram	Skill birth attendant (SBA): doctor, nurse, midwife	Mixed-method, quasi-experimental	89
3	Rahman et al.	2019	India	E-partograph	SBA (doctor, nurse, midwife)	Quasi-experimental	100
4	Schweers et al.	2016	India	M-labor	Doctor	Qualitative	50
5	Singh et al.	2016	India	Prasav graph	Doctor	Qualitative	50
6	Juwita et al.	2019	Indonesia	Midwifery documentation use web-based	Midwives	Cross-sectional	50
7	Singh et al.	2021	India	E-partograph	Staff nurses and medical officers	Cross-sectional	75
8	Litwin et al.	2018	Tanzania	E-partograph	SBA	Qualitative	50
9	Tandiallo et al.	2019	Indonesia	Web-based partograph	Researcher	Quasi-experimental	100
10	Tadesse et al.	2019	Northwest Ethiopia	E-partograph	Prenatal care providers (midwife, nurse, health officers, doctor)	Cross-sectional	100
11	Ulfa et al.	2020	Indonesia	Digital partograph	Midwife students	Cross-sectional	50
12	Singh et al.	2019	India	Digital Partograph and Intrapartum Monitoring Mobile Application	Nurses	Cross-sectional	88
13	Ningrum et al.	2019	Indonesia	Digital partograph	Midwife	Qualitative	70

The results of the article analysis explained the reasons for developing this application-based partograph to solve various problems that arise when using paper partographs, one of which was the very low use of paper partographs (23). From the results that could be seen, the use of e-partographs revealed that the frequency of recording appears to be higher on web-based partographs, which is 26 (86.7 %), compared to the speed of recording using conventional methods, which is 25 (83.3 %) (20), the majority of SBA (87 %-91 %) completed Partograph filling (2), WEB-based partographs were faster in recording contractions, oxytocin, and delivery p-value 0.0001 (P<0.05) (21). Therefore, these results indicated that the e-partograph was more effective in maintaining normal delivery, preventing complications during labor, and increasing use during labor monitoring.

Advantages of e Partograph with paper Partograph

Partograph is an instrument to track record the progression of labor. The key parameters in the partograph are the progression of labor (cervical dilating, contractions, and descent of the bottom portion), maternal health (systolic pressure, pulse, and temperature), and fetal condition (fetal heart rate, amniotic fluid, and moulage). In monitoring the paper partograph, the filling and interpretation depend on the person filling it out. In e-partograph, several advantages could be felt when using it. Moreover, the partograph application (e-partograph) was developed in the form of a mobile phone or tablet based on android with a web-based computer device, with the advantages made by each developer. One of the benefits of using a partograph is making decisions when monitoring labor, whether this delivery can be assisted or action is needed (23,24). The e-partograph has several advantages over the paper partograph in some system applications, which are made by adding notification features in the form of audio and visual warnings, which show the charging time and complications that occur in mothers and babies. This notification system helps users to determine what decisions and actions to take.

In some applications, there are other advantages, such as storing data filled in and graphs appearing according to the data filled in with varying display results. In addition, this partograph program has made use of a "delay-tolerant framework," making it usable even in unfavorable internet network circumstances (25), and some can even be used without using the internet network (23). This shows that the e-partograph has other benefits compared to the paper partograph. Throughout the labor and delivery process, several inventors have concentrated on low-cost digital solutions to address problems with the paper partograph, improve care quality, enhance documentation, and facilitate decision-making (19).

Acceptance of e-Partograph Among Health Workers

Application development on partographs aims to make it easier for users to fill in partographs. Most SBAs agree that the e-partograph greatly simplifies filling and increases its use, but it should be a concern for obstetric services with a high rate of delivery cases. It takes a lot of trained SBA to be more optimal in their utilization (17). Almost all SBA (93 %) showed confidence and comfort in using e-Partograph. SBA gave a positive impression and felt efficient and easy to use. The SBA expresses faith in their capacity to comprehend and take action on the reminders and cautions provided in the e-partograph. The SBA's behaviour in relation to filling out the partograph changes while using the e-partograph (8,26).

DISCUSSION

Digital partographs are designed to solve various problems arising from paper partographs (23). Many researchers are developing partograph applications in various countries in the world, but all of them have different effectiveness, advantages, and levels of acceptance.

Based on Sanghvi et al. (2017), using the e-partograph application has higher effectiveness than using the paper partograph (23). It was determined that using an electronic partograph reduced the likelihood of a complicated fetal outcome by 56 % (95 % CI = 27 % - 73 %) compared to a conventional partograph. The practitioner uses partographs to a much greater

Table 2. Summary of Selected Studies.

Nº	App Name	Description	Outcome	Results
1	Life Curve	Android-based application, equipped with colors that appear on the screen to describe the condition of the mother and children	The utilization of the life curve	The overall results for the paper partograph (19.52) and the Live Curve (42.7) are significantly different from one another (p.001). However, the average SD score for the life curve is remarkably higher (4.74±.52) than for paper partographs (2.17±1.18): p.0002.
2	e-partogram	Application based on android tablet, there is an audio and visual reminder system when it comes to doing the next check and in case of complications	The utilization of e-Partogram to maintain normal delivery	There are 842 active phase maternity customers using e-Partograms and data from 1,042 clients observed using paper partograms. The e-partograms usage was 56 percent (95 %t CI= 27 % -73 percent) with fewer chances of fetal outcomes problems than paper partographs.
3	e-partograph	Tablet, smartphone, or computer-based applications. A system emits a red signal if it shows complications during labor. The application can store data both locally and remotely in a central database.	The evaluation of partograph applications' viability and efficiency	Labor monitoring used paper partographs to identify 42% of long hours worked; during phase 2, monitoring with e-partographs showed just 29% of long hours worked. Similar outcomes were seen at Jessore DH, where paper partographs lowered lengthy labor rates from 30% to 7%.
4	m-labor	A mobile application refers to the WHO partograph. The display on the screen is not boring and minimizes filling errors.	The use of m-labor in documenting partographs	m-labor lets professionals use a reminder system, emergency decision support, and assistance for the entire patient lifecycle, from admission to referral, which is all included in labor.
5	PrasavGraph	The program is built on android and was created using a delay-tolerant architecture, allowing it to function even with unreliable internet connections.	PrasavGraph application for childbirth monitoring	It is easy to use on a smartphone, so it is hoped that the partograph will be easier to use in the delivery process of health workers in the peripheral area, which is still very low until now.
6	Midwifery Documentation Use Web Based	The application web-based	Recording Speed	The frequency of recording appeared to be higher on web-based partographs, namely 26 (86.7%), compared to the speed of recording using conventional methods, which was 25 (83.3%)
7	e-partograph	The tablet-based partograph application used is named DAKSH. The app allows the integration of several features, such as alerts and alarms, to improve the user experience.	The use and acceptance	Tablet-based partographs were preferable to paper-based ones since they saved time and were simple to use. It offers a reminder option, which is helpful for healthcare professionals.
8	e-partograph	Partograph app for Android tablets, with a focus on enhancing the simplicity and effectiveness of real-time documentation	The feasibility and use of e partograph	Most SBA (87–91%) completed the ePartogram by registering the client, making the first and subsequent observations, and using the screen on the first shift.
9	Web-Based Partograph	Computer-based partographs with the use of internet networks	The utilization of web-based partographs	The WEB-based partographs were quicker for documenting contractions, oxytocin levels, and delivery processes. In addition, the accuracy of internet-based partographs in earlier detection, which showed a p-value of 0.000 (0.05), and emergency detection, which has a p-value of 0.014, can be used to compare their use to that of conventional partographs (0.05).
10	e-partograph	Partograph in mobile phone	Mobile phone usage for e-Partograph	205 smartphone owners (or 46% of them) used e-partograph. Healthcare with a positive attitude toward Partograph (AOR = 2.76.95% C.I: 1.49-5.09) and education in linked fields (AOR = 7.63.95% C.)
11	Digital Partograph	web-based partograph design	Utilizing digital partographs as a teaching tool	The signification of the p-value displayed 0,0001 < 0.05, meaning that electronic partographs as a medium of education are very effective for developing partographic filling of students' skills.
12	Digital Partograph and Intrapartum Monitoring Mobile Ap-plication	The tablet-based DAKSH application. Real-time labor monitoring, fundamental decision-making help with better warnings, and logging are all app features.	The utilization of DAKSH	Around 463 births were observed at the hospital, of which 91.56 % (n=424) were registered in the application.
13	Digital Partograph	Android-based partographs, real-time recording, there is a notification system in case of labor difficulties can be accessed on the play store	The use of digital partographs, behaviour change, stakeholder support	The study results show that the Google Playstore's digital partograph application can already be used to track the progress of births. Midwives are behaving differently when using digital partographs as a result of their accessibility.

extent to adhere to typical labor observations (17). Rahman et al. in 2019 made the same claim, explaining that the facility-based cesarean section rate is trending downward in both institutions, dropping from 43 % in Jessore to 37 % and from 36 % to 25 % at Kushtia Hospital in Banglades (16). Similar outcomes were shown in Jessore, Bangladesh, where the percentage of protracted labor was lowered from 30 % of long labor recorded by e-partograph to 7 % with paper partographs. Most health professionals finished filling out the e-Partogram: registering patients, first and subsequent observations, and utilizing screens easily on the first shift; the usage of the e Partogram to monitor 103 births in 84 shifts; the fifth shift reported a rise to 100 % (8,16). In terms of recording, the use of e-partographs is reported to be more effective when compared to paper partographs, as stated by Ahmad et al., 2019 that the study results revealed that the frequency of recording appears to be higher on web-based partographs, which 26 (86.7 %) compared to recording speed using conventional methods that are equal to 25 (83.3 %) (25). The previous research revealed that for recording contractions, oxytocin, and births, an internet-based partograph was easier to use than a traditional partograph (21).

Additionally, the early detection precision of the web-based partograph has a p-value of 0.0001 (0.05), and its accuracy in emergency detection is 0.014 (0.05), indicating that it differs from conventional partographs. The referral process' p-value, however, is 1 000 (>0.05), indicating that there is no distinction between the use of WEB-based partographs and traditional partographs (25). Study on the digital partograph is a highly effective learning tool for acquiring partographic knowledge, according to research on the effectiveness of the e-partograph as a teaching aid for students. Based on Begum et al., 2020, the e-partograph application has the advantages of being easier to fill out, automatically generating graphs, more interesting to work with, providing timely automatic reminders to evaluate mothers in labor, generating digital color-coded warning numbers, and sending automatic text messages to supervisors in situations abnormal (20). Singh et al., 2019 also showed that e-partographs are easy to use on smartphones, so it is hoped that partographs will be easier to use in the delivery process by health workers in the periphery, which is still very low (22). Research on the advantages of the e-partograph was also carried out by Ningrum et al., 2019, and it demonstrated that the digital partograph's information system complied with the demands for system excellence, information excellence, and user satisfaction (26). Digital partographs have been useful for clinical decision-making, tracking the course of labor, documenting, keeping tabs on the health of the mother and fetus, and gaining support from involved people for such applications. Several studies have also assessed the level of acceptance of e-partographs by health workers. Nursing and medical professionals concluded that tablet-based partographs are superior to paper-based partographs because they are quicker and simpler to use (24). Research by Litwin et al. (2018) showed that almost all health workers (93 %) Health professionals reported a positive opinion of the e-Partogram and believed that it was effective and simple to use (8). Additionally, they showed trust in their ability to understand and respond to these e-reminders partograph's throughout the fifth shift (8,19). The level of acceptance of e-partographs in terms of cellphone ownership for application installation, from the survey results, it was found that 205 (46 %) were eager to use cell phones for e-Partographs (19).

CONCLUSION

Most studies showed that the development of an application-based partograph aimed to facilitate the process of monitoring labour. With the e-partograph, the result of delivery was better than with the paper partograph. E-partograph maintained normal delivery and reduced the incidence of caesarean section and prolonged labour. In addition, the e-partograph provided the advantage that there was an audio and visual reminder system that could be used to detect complications during childbirth. Furthermore, all data was stored and could be accessed again to make the documentation system easier. The level of SBA acceptance of the e-partograph was excellent, as evidenced by the higher use of the e-partograph compared to the paper partograph.

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